WESTERN GAS

ugust
1929

20 Cents
the Copy

From a block print by Aleta Ernest

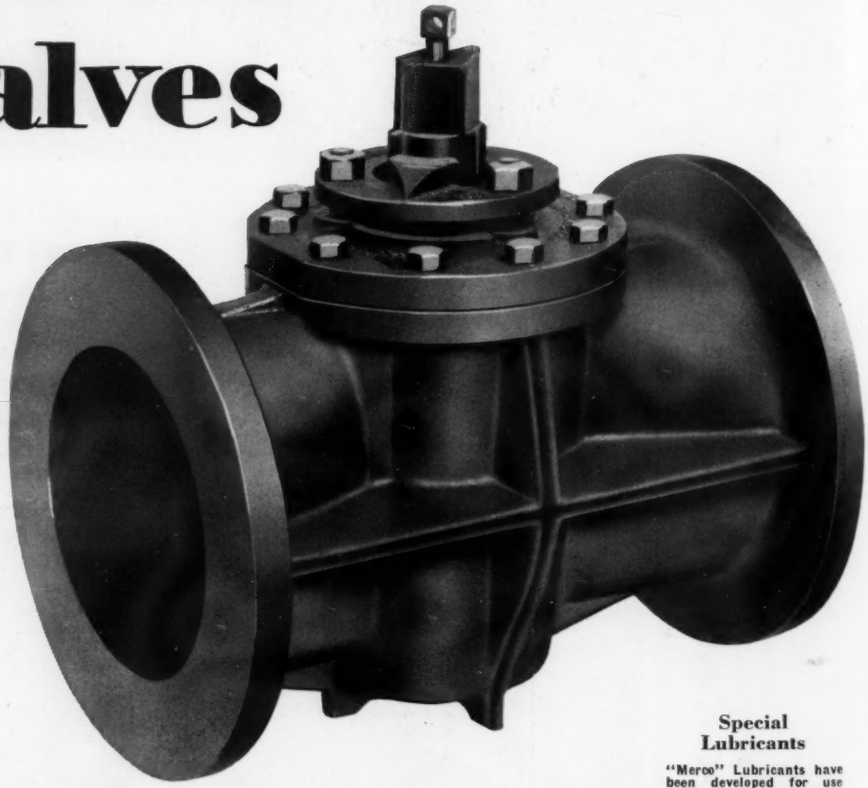
GAS STORAGE AS AN INDUSTRIAL ART THEME

A MONTHLY JOURNAL DEVOTED TO THE
WESTERN GAS & APPLIANCE INDUSTRIES

PRINT IN BINDING

Nordstrom "Venturi" Valves

Won't leak
Won't stick
Economical
Compact



Special Lubricants

"Merco" Lubricants have been developed for use in Nordstrom "Venturi" Valves. These lubricants are made of special materials for specific services in the Gas industry.

Lubricated

Before the advent of the Nordstrom principle of Pressure Lubrication, it was not feasible to build plug cocks in sizes larger than 6″, because of their tendency to stick and bind. But the Nordstrom lubricating feature whereby the plug is jacked up by hydraulic pressure while at the same time the lubricant seals and lubricates the ground surfaces, has made it possible to build Nordstrom "Venturi" Valves in sizes up to 30″.

Nordstrom "Venturi" Valves are moderate in cost. They are compact and can be installed where economy of space is important. They are more economically and easily handled. They are easy to operate. Little lubricant is required to keep them in proper working condition and they provide a positive seal against leaks. The original and genuine Lubricated Valves for the Gas Industry.

Ask for Catalog No. 6.

MERCO

Merco Nordstrom Valve Company

Subsidiary of the Merrill Company

Engineers - - - Manufacturers

Boston—184 Boylston St.
Buffalo—Genesee Bldg.
Chicago—176 West Adams Street
Dallas—Magnolia Bldg.
Detroit—2842 West Grand Blvd.
Houston—Petroleum Bldg.
Los Angeles—556 South San Pedro Street
New Orleans—Masonic Temple Bldg.
New York—11 West 42nd Street
Pittsburgh—Clark Bldg.
San Francisco—343 Sansome Street
Seattle—Colman Bldg.

AGENCIES IN PRINCIPAL CITIES

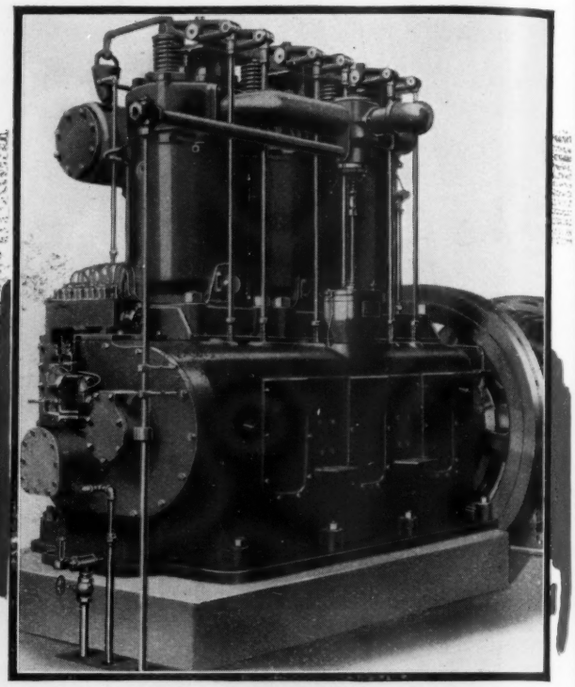
Factories: Oakland, California and Belleville, New Jersey. Canadian Manufacturers — Peacock Bros., Ltd., Montreal, Cobalt, Winnipeg, Vancouver. England—Audley Engineering Co., Ltd., Newport, Shropshire.

FOR SEVENTY YEARS ROOTS BLOWERS HAVE EXCELLED AT THEIR JOB OF GIVING A CONSTANT VOLUME OF AIR—POSITIVELY DELIVERED. FOR ALL TIME TO COME THEY WILL STILL BE GIVING MAXIMUM SERVICE AND SATISFACTION TO THEIR USERS.
ROOTS Rotary Positive Displacement
BLOWERS GAS PUMPS METERS
BOOSTERS EXHAUSTERS GOVERNORS
LIQUID PUMPS MACHINE PUMPS COUPLINGS
RELIEF VALVES BLAST GATES BAND GATES
PRODUCTS
Built by Roots Engineers and Manufacturers Since 1859
"Roots Users Root for Roots"
The P.H. & F.M. ROOTS CO.
CHICAGO Peoples Gas Building
CONNERSVILLE, INDIANA
NEW YORK 120 Liberty Street

Western Representative: SUTOR & CO.,
2008 East Slauson Ave. Los Angeles, California

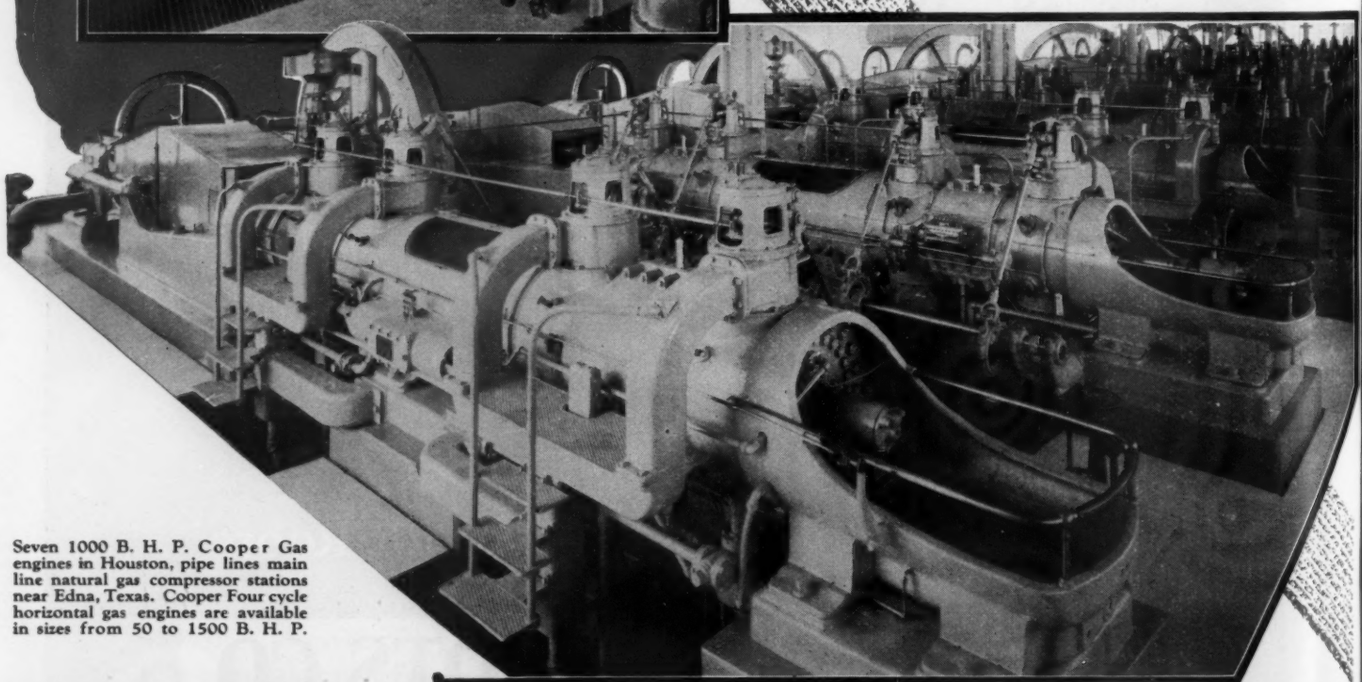
August, 1929, Volume V, Number 8. WESTERN GAS is published by Western Business Papers, Inc., at 124 West Fourth Street, Los Angeles, California. Subscription price (in advance) 20 cents the copy; $2.00 per year; 3 years $5.00; $3.00 per year foreign. Entered as second class matter June 1, 1925, at the postoffice at Los Angeles, California, under the Act of March 3, 1879.

A TRIPLE



Eighteen Bessemer Type-10 two cycle gas engines in one of Carter Oil Company's gasoline plants in the Seminole field. Bessemer two and four cycle engines are built for every oil and gas field service in sizes from 12½ to 200 H. P.

A Hope 200 H. P. three cylinder vertical gas engine driving an alternating current generator in oil field service. Hope vertical engines are now built in sizes from 80 to 540 H. P. by the Cooper-Bessemer Corporation for every power service.



Seven 1000 B. H. P. Cooper Gas engines in Houston, pipe lines main line natural gas compressor stations near Edna, Texas. Cooper Four cycle horizontal gas engines are available in sizes from 50 to 1500 B. H. P.

COOPER

ALLIANCE

COOPER - BESSEMER - HOPE

THE Cooper-Bessemer Corporation inherits all of the specialized knowledge, all of the rich experience gained by Cooper in the gas field, Bessemer in the oil field, Hope in the power and lighting field. Joined together, these three factors form a triple alliance for greater service, greater research and development, greater reliability and economy in power production.

Ninety-six years ago two Cooper brothers built their first horse-sweep for driving the Cooper cupola at Mt. Vernon. Then came throttling steam engines, locomotives, farm engines, Corliss engines. The first Cooper 4-cycle horizontal gas engine entered compressor service in West Virginia. It is still in constant service, and Cooper has become the leader in furnishing power requirements for the transmission of natural gas through pipe lines. Cooper engines are also in service in refineries, in gasoline plants and in electric plants. In addition, Cooper has been building Diesels.

Thirty years ago the first Bessemer oil field engine entered service in Pennsylvania. Since then Bessemer has been the leading builder of 2-cycle horizontal gas engines for drilling, pumping, pressure work, pipeline pumping, gasoline plants, booster stations, and for power service in refineries. In addition, Bessemer has been an outstanding builder of Diesel oil engines.

Twenty-nine years ago the first Hope 4-cycle vertical gas engine was installed. Twenty-eight years later the Hope was acquired and still further improved by Cooper. Each succeeding year has added to the high prestige of this engine for auxiliary power in main line and booster stations — in gasoline recovery plants — for power and lighting plants — in divers industries.

With these three lines combined and standardized, you can now get a Cooper, a Bessemer or a Hope that meets your conditions exactly.

THE COOPER-BESSEMER CORPORATION

Formerly The C. & G. Cooper Company and The Bessemer Gas Engine Company

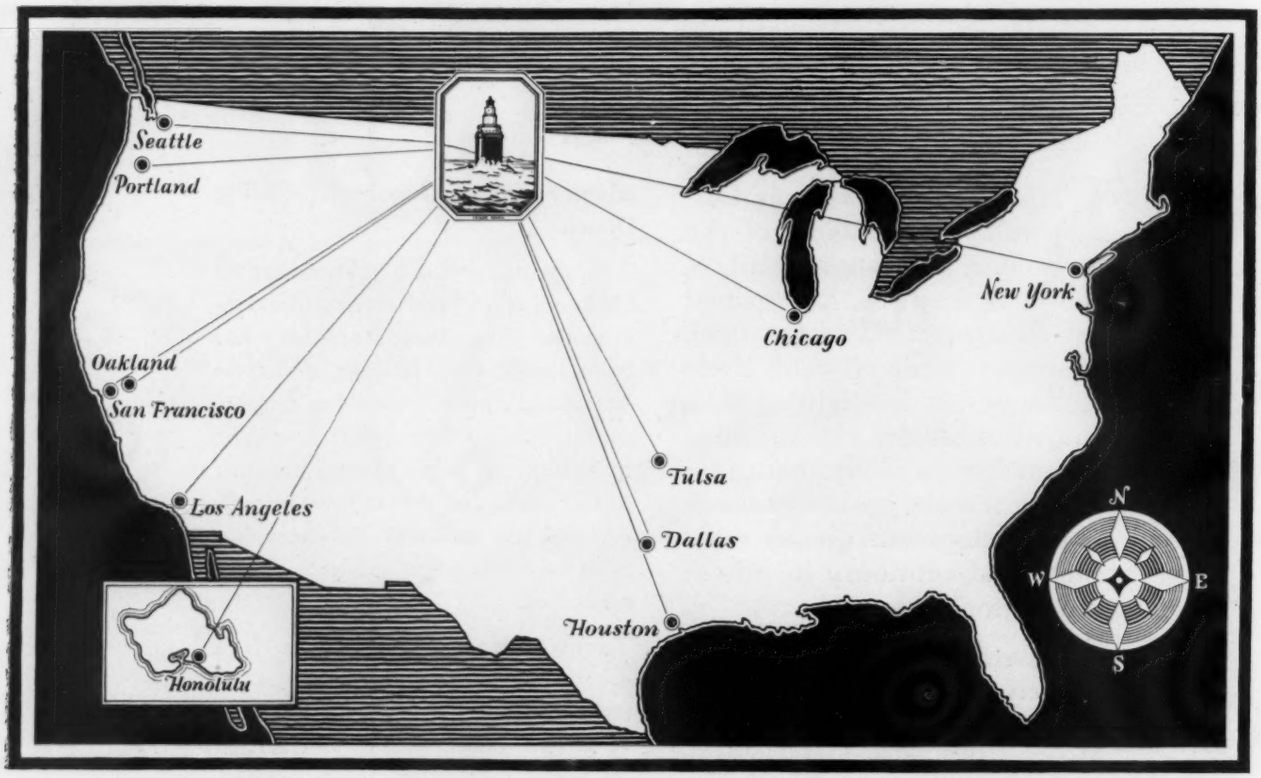
MOUNT VERNON, OHIO — GROVE CITY, PA.

1116 MAGNOLIA BLDG., DALLAS — 630 E. 61st ST., LOS ANGELES, CAL.

615 KENNEDY BLDG., TULSA, OKLA.

BESSEMER

A PAINT SERVICE .. that extends across the continent..



..and to every Paint requirement..

The time tested policy of making only quality paint products has won for Hill, Hubbell & Company's paint brands a merited recognition that now extends across the continent. Far away Honolulu knows and demands the superior paint surfaces represented by the famous Lighthouse trademark, the marketing emblem of a better paint service.

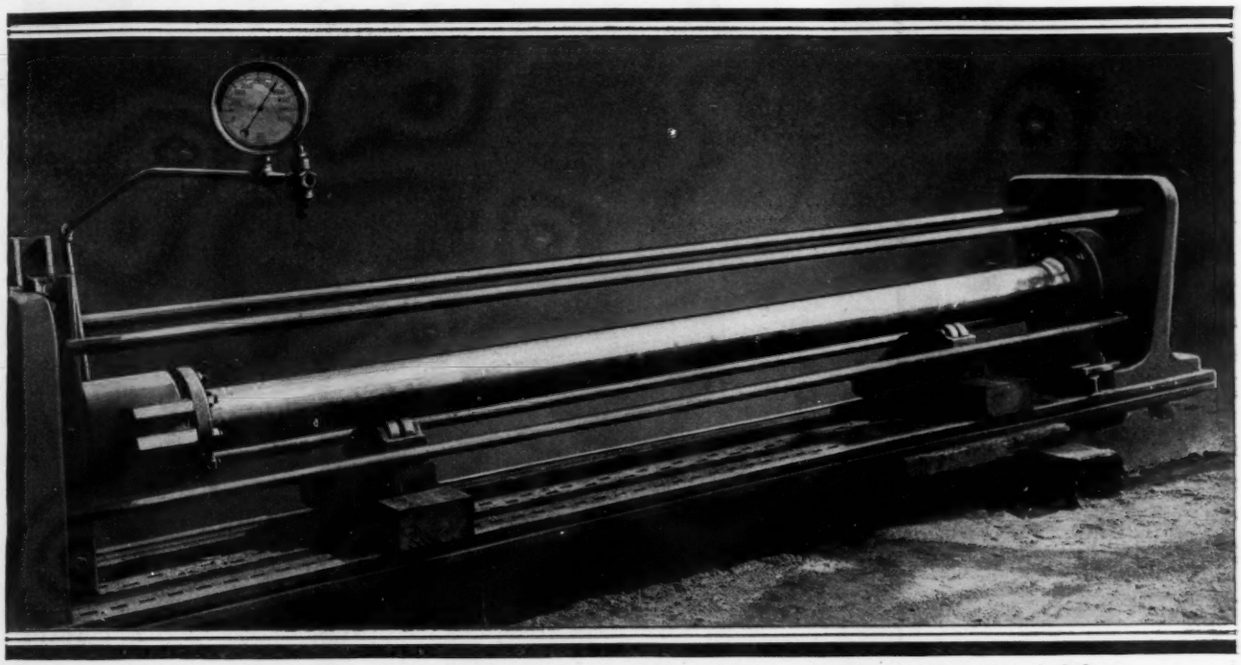
Added prestige has come as the reward of the progressiveness which is responsible for the introduction of a new standard of pipe protection — the mechanical coating and wrapping of pipe. Since October of last year more than 3,000 miles of mechanical coated and wrapped pipe have been shipped from six plants located adjacent to the larger pipe mills of the country. The uniformly greater protection afforded through this modern method again distinguishes this latest Hill, Hubbell & Company development as it has in the past distinguished their entire line of color paints, enamels, varnishes, and specialties.

HILL, HUBBELL & COMPANY

Division
General Paint Corporation

Manufacturers of Highest Grade Oil Industry Paints and Pipe Line Coatings
General Offices: SAN FRANCISCO
Mid-Continent Factory: TULSA
Offices:
SAN FRANCISCO - TULSA - NEW YORK - CHICAGO - LOS ANGELES - HOUSTON - PORTLAND - SEATTLE - SPOKANE

Dramatic Evidence
of the superior strength of deLavaud pipe



The above photograph was taken during a hydrostatic bursting test of deLavaud Pipe. Details below.

3,350 lbs. per square inch was the pressure required to burst the 6-inch deLavaud Pipe shown above. This pipe was selected at random from stock, placed in a special test press and submitted to tremendous water pressure from a force pump. Gauge readings were accurately checked.

When the pressure was first applied, the gauge needle moved up quickly to the 2,000 lb. mark. Thereafter it advanced more slowly to a reading of 3,350 lbs. per square inch—*a pressure reading fully 25% higher than could possibly be obtained with pit cast pipe designed for the same service.*

The remarkable strength of deLavaud Pipe is due to the dense, close grained structure of the metal, and to the metal's freedom from slag and blow holes. deLavaud Pipe is made by pouring molten iron into a rapidly revolving cylindrical mould. Centrifugal force holds metal against sides of mould, driving out impurities with a pressure resulting from a force *40 times greater than gravity.*

Also, the action of water-cooled deLavaud mould and the subsequent annealing further improve the physical properties and the microstructure of the metal. Let us send you the deLavaud handbook and all the facts about deLavaud Pipe.

Cast iron pipe made by this Company bears the "Q-check" trademark of The Cast Iron Pipe Research Association.

United States Pipe
and Foundry Co., Burlington, New Jersey

Sales Offices: **New York, Philadelphia, Pittsburgh, Cleveland, Buffalo, Chicago, Dallas, Birmingham, Kansas City, Minneapolis, Seattle, San Francisco, Los Angeles**

Co-operative Load-Building

and Sales-Promotion Campaign

Starts August 14

An awakening industry speaks! A vision is about to become a reality! Plans are completed and funds provided for the first coastwide advertising campaign by the Gas Industry of the Pacific West.

Appropriately, this new era in co-operative load-building will be ushered in by advertising's newest medium: Radio.

Beginning Wednesday, August 14th, weekly programs will be broadcast over the Pacific Coast Network of the National Broadcasting Company:

KFI—Los Angeles
KGO—Oakland
KOMO—Seattle
KPO—San Francisco
KGW—Portland
KHQ—Spokane

Announced as "sponsored by your own gas company", these programs will become a feature of the Woman's magazine of the Air, an established *morning* hour, with thousands of eager followers among home-loving women. Each radio program will convey a convincing message on the contributions of gas and modern gas appliances to home comfort, health and happiness.

The MODERN Fuel
Gas
QUICK . . CLEAN . . SURE

This slogan sounds the keynote of the campaign. It appears on display cards, newspaper "tie-in" advertisements, r e c i p e booklets and trade-journal advertisements.

Industrial Advertising, Too

September issues of leading trade journals will carry the first of a series of full-page advertisements, addressed to important industries of the entire Pacific West.

These advertisements will deliver straight-from-the-shoulder sales messages, supported by facts and figures. They will speak the language of each industry addressed—selling and *re*-selling the ideal fuel, GAS.

Tune in for the first radio program—10:50 A. M. Wednesday, August 14th.
Read opposite page on how to capitalize this campaign.

A Significant Message

from C. H. Dickey, President, P. C. G. A.

to the Entire Industry

"Too long the gas industry has been content to serve only those customers who came unsolicited. It is now time that the good qualities of gas as an agent of domestic happiness and industrial prosperity should receive the same degree of exploitation that has been lavished upon other, and often competing, services.

"And it is well that this exploitation should be co-operative; for the task is the job of the entire industry, and the co-operative idea has proved its value in many nation-wide experiments.

Portfolio of Advertising

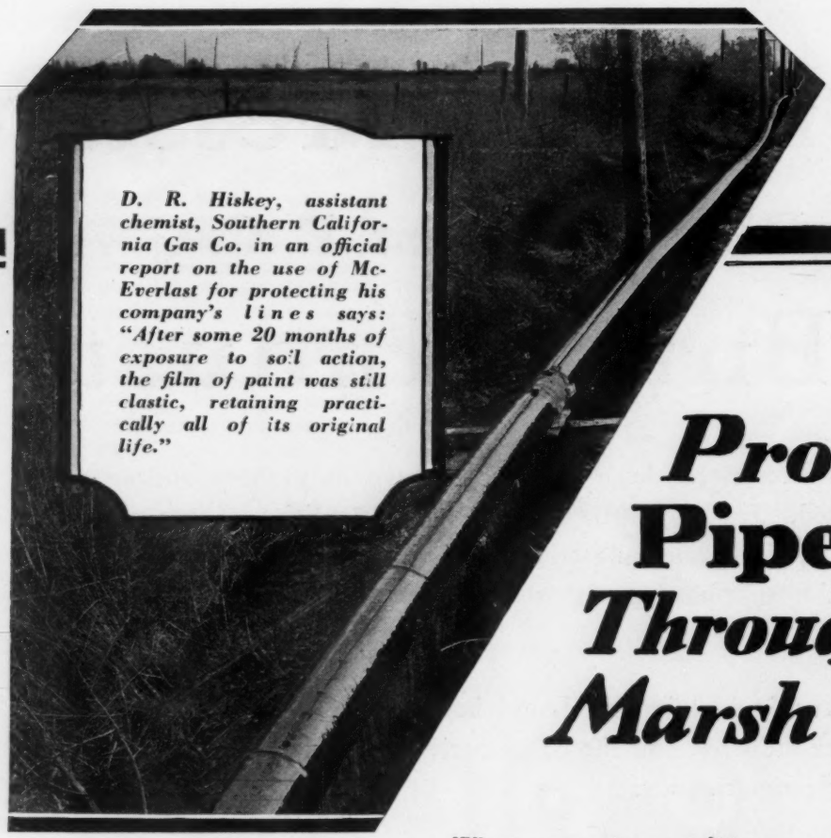
"A portfolio of this campaign will be delivered to all company members of the Association about August 10th. It contains many valuable suggestions on how the utility company, the manufacturer and other branches of the industry can assist in the movement, to the benefit of the industry in general and the profit of the individual in particular.

"My exhortation to the men of the industry is that you fully acquaint yourselves with the contents of this portfolio. Then employ every avenue of publicity to popularize our radio broadcasts; take full advantage of the opportunities afforded by our trade journal advertising; and carefully co-ordinate your sales efforts with those of the Association."

For full particulars concerning this campaign—supplies for your participation—and samples of the new recipe booklet to be offered free to radio-listeners—address Clifford Johnstone, Executive Secretary.

Pacific Coast Gas Association

447 Sutter Street **San Francisco**


D. R. Hiskey, assistant chemist, Southern California Gas Co. in an official report on the use of McEverlast for protecting his company's lines says: "After some 20 months of exposure to soil action, the film of paint was still elastic, retaining practically all of its original life."

Protecting Pipe Lines Through Alkali Marsh Lands-

Where corrosive conditions are at their worst, McEverlast protection is safeguarding the pipelines of some of the biggest industries. In the Seminole, West Texas and Gulf Coast regions and certain sections of California, these lines lie in marshy soils—soils saturated with biting acids and alkalies. Yet no matter how bad the soil, McEverlast protection keeps them in good condition.

Usually Applied Cold

For most purposes McEverlast coatings are applied cold—"almost as fast as a man can walk," in the words of one engineer. In good soil conditions, no reinforcing fabric is used. Under bad conditions, McEverlast Osnaburg wrapper is combined with the cold coatings and in extreme conditions a hot coat is also applied. This forms a tough, durable coating which won't crack or chip and resists injury from soil pressure.

Other McEverlast Products

Special coatings for tanks, concrete foundations and other exposed and underground surfaces fully described in our booklet, "Protecting Pipelines and Exposed Metal Surfaces with McEverlast Protective Coatings." Let us mail your copy today.

McEVERLAST, INC.
[TM REG.]

111 West Seventh St., Los Angeles, Calif.

Branches

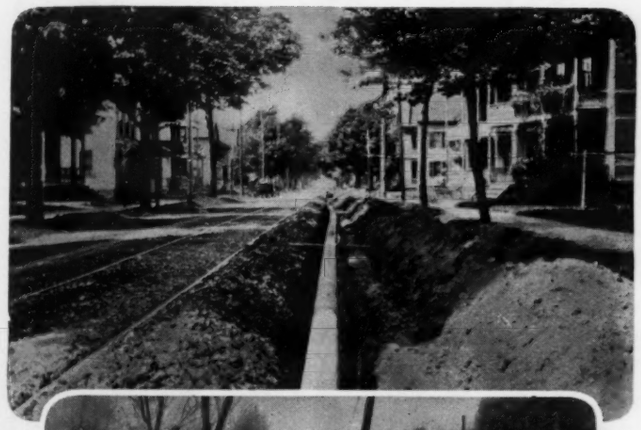
35 E. Wacker Dr., Chicago, Ill.

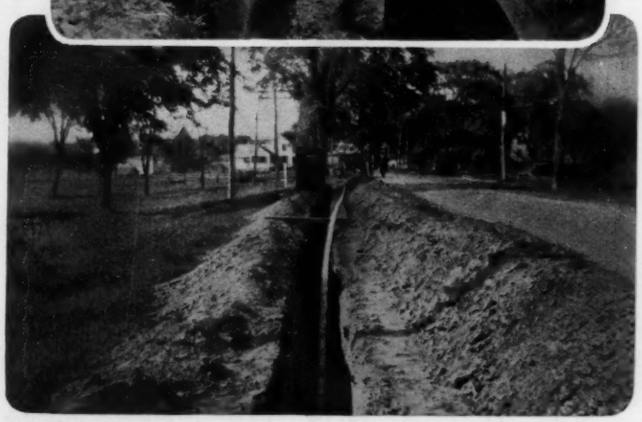
1754 Graybar Bldg., New York, N. Y.

1314 Magnolia Bldg., Dallas, Texas.

Offices in principal cities

There is no substitute for DEPENDABILITY on jobs like these





DEPENDABLE pipe is desirable at all times, but it is especially important that pipe laid under city streets and suburban roadways should be dependable beyond all theory or chance—it must be dependable in *fact*—proved so by the test of time and character of service over years and years of actual use.

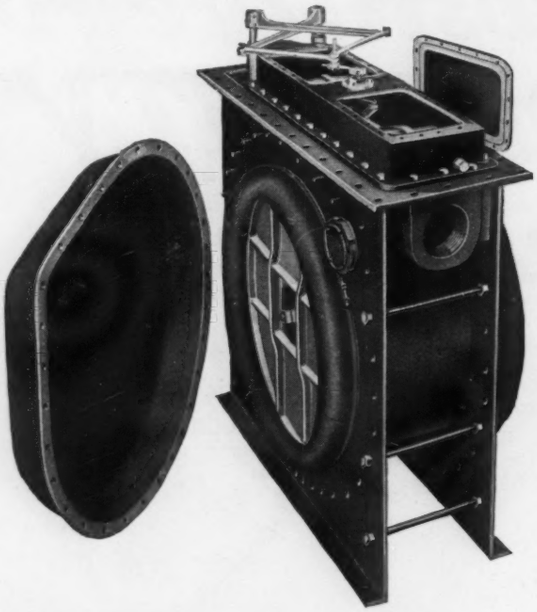
That expensive paving and road surfaces will not be disturbed—that traffic will not be inconvenienced—that costly repair work will not be entailed—means that a tight-jointed, vibration-resisting, shock-absorbing, load-withstanding, corrosion-combating pipe must be used. This means pipe that is exceptionally uniform, that has great strength and sufficient ductility. In short, pipe that promises every necessary quality for long years of underground service.

In addition to being a dependable pipe —NATIONAL Pipe can be furnished in double random lengths—either threads and couplings, plain end for patent couplings or beveled for autogenous welding. And there is a size for every gas line requirement—no matter how small or how large.

America's Standard Wrought Pipe

NATIONAL TUBE COMPANY - Pittsburgh, Pa.

Subsidiary of United States Steel Corporation



Inside the EMCO *Five*

The pressed steel meter that revolutionized large capacity gas measurement

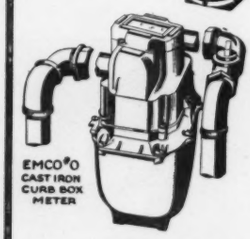
TEN thousand cubic feet per hour measured with a pressure drop of less than two inches of water, has been made possible by the pressed steel case construction, tested at a pressure of 100 pounds per square inch. Diaphragms are of sheepskin, formed and seasoned carefully, mounted on terne iron pans, which are reinforced to maintain absolute rigidity.

The tangent adjustment is a new and exclusive feature. The flag rod and movement have been designed by our engineers to eliminate any chance of giving trouble. The EMCO exclusive valve arrangement, whereby valves are set in line with each other, includes valves and valve seats of special white metal alloys worked out in our own laboratories.

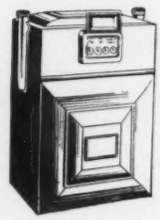
EMCO—*Wherever you go*

EMCO #0 CAST IRON DRY GAS METER

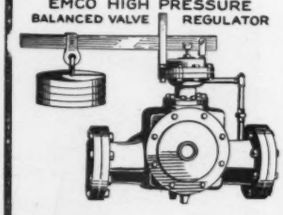
IRONCLAD CAST IRON DRY GAS METER



EMCO #0 CAST IRON CURB BOX METER

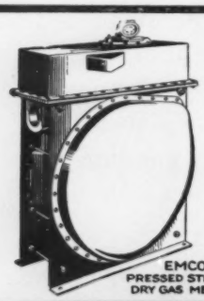


EMCO TIN METER

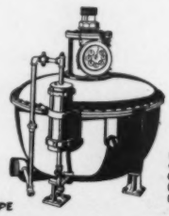


EMCO HIGH PRESSURE BALANCED VALVE REGULATOR

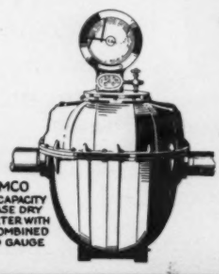
EMCO WATER HEATER AND GAS APPLIANCE REGULATOR



EMCO #5 PRESSED STEEL TYPE DRY GAS METER

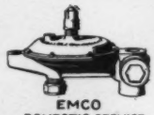


WESTINGHOUSE FLUID POSITIVE GAS METER

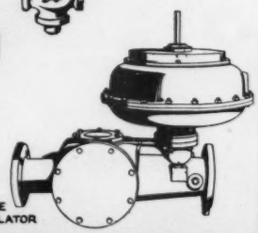


EMCO LARGE CAPACITY CAST CASE DRY GAS METER WITH EMCO COMBINED RECORD GAUGE

EMCO ORIFICE GAS METER



EMCO DOMESTIC SERVICE REGULATOR



EMCO LOW PRESSURE BALANCED VALVE REGULATOR

PITTSBURGH EQUITABLE METER COMPANY

MAIN OFFICE AND WORKS PITTSBURGH, PA.

NEW YORK CHICAGO COLUMBIA, S.C. LOS ANGELES DALLAS TULSA SEATTLE KANSAS CITY SALT LAKE CITY

Going Back to Baltimore *for*

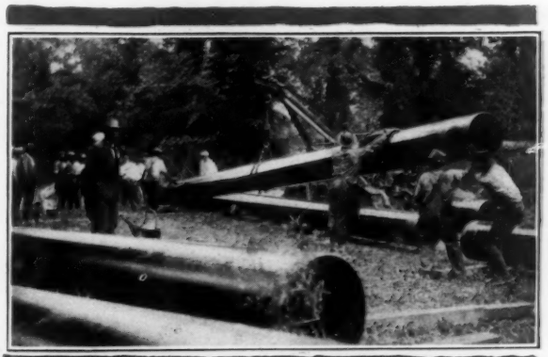
PROOF

PROVEN PROTECTION FOR PIPE LINES

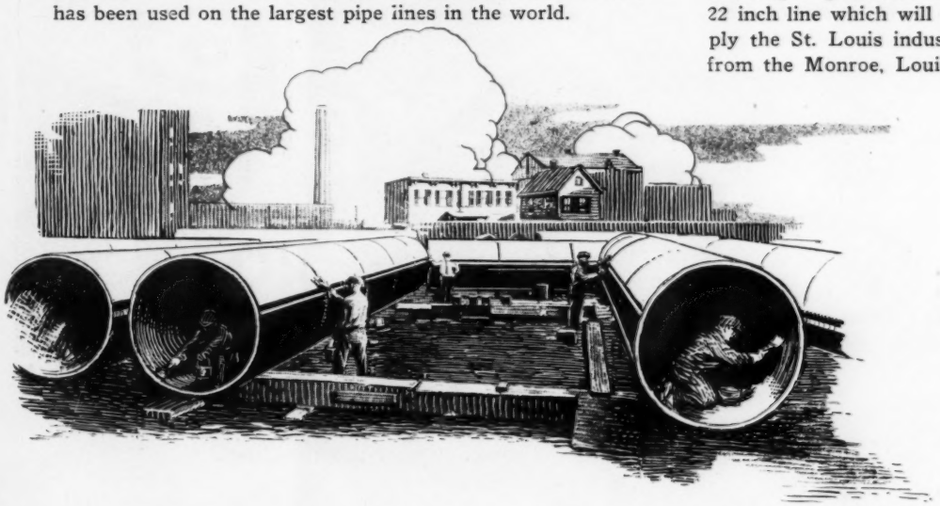
In 1915 the 84 inch steel water main laid by the Baltimore Bureau of Water Supply was coated with ***Bitumastic Enamel*** as a protection against corrosion.

In 1926, eleven years later, the Bureau reported that the main had been inspected at several points and "the enamel found in excellent condition." It was its conservative opinion that "***Bitumastic Enamel*** affords a good protection."

When such a proof of protection can be furnished for hundreds of applications of ***Bitumastic Enamel*** and for periods up to forty years of service, no mere CLAIM of merit should be considered in the selection of a protective coating. A great deal of study has been given to this question—particularly in connection with big projects where millions of dollars are invested in construction of large oil and gas lines. The conclusion of these studies is invariably to choose a PROVEN coating and ***Bitumastic***, therefore, has been used on the largest pipe lines in the world.



Showing ***Bitumastic Enamel*** being applied by the Turning Rig method on the new St. Louis Line—a 22 inch line which will extend for 460 miles and supply the St. Louis industrial district with natural gas from the Monroe, Louisiana, fields.



We have now in preparation a new book on the protection of oil and gas pipe. Shall we reserve a copy for you?

BITUMASTIC

REG. U.S. PAT. OFF

ENAMEL

Wailes Dove-Hermiston Corporation

17 Battery Place, New York

2464 Enterprise St., Los Angeles, Calif. 345 Vermont St., San Francisco, Calif.

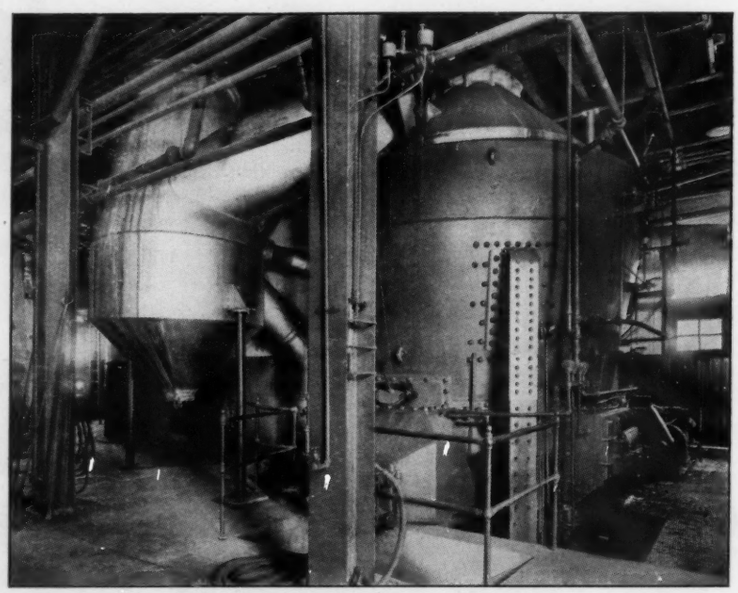
Philadelphia Cleveland Chicago Houston Tulsa San Francisco

The new U. G. I. *Cyclonic Dust Catcher*

....another contribution to the industry

The new U. G. I. Cyclonic Dust Catcher —now in operation at Paterson and Camden, N. J.—has the following advantages:

- Removes blown-over fuel, including very fine dust, at the outlet of the generator.
- Has very high efficiency of dust removal.
- Greatly decreases number of recheckerings necessary.
- Reduces cost of recheckering and shutdown time.
- Prevents erosion of carburetter wall and checker supporting tile.
- Particularly advantageous when using soft coal as generator fuel.
- Increases efficiency of oil utilization because checker brick remain cleaner.



The U. G. I. Cyclonic Dust Catcher can be installed on most any water gas set and will pay for itself in about a year's operation.

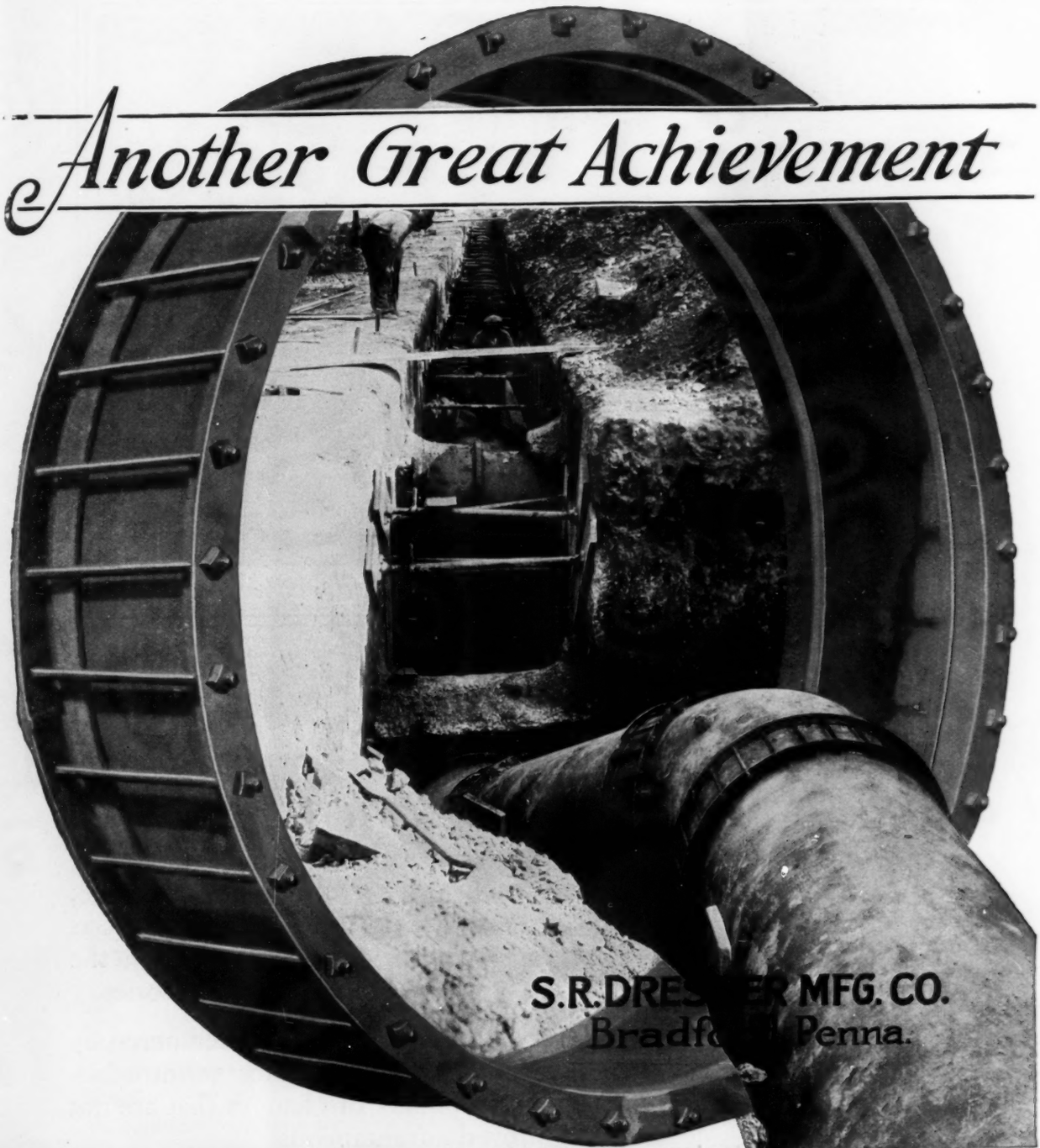
THE U. G. I. CONTRACTING COMPANY
DIVISION OF
UNITED ENGINEERS & CONSTRUCTORS
INCORPORATED
DWIGHT P. ROBINSON, PRESIDENT

Broad and Arch Streets, Philadelphia

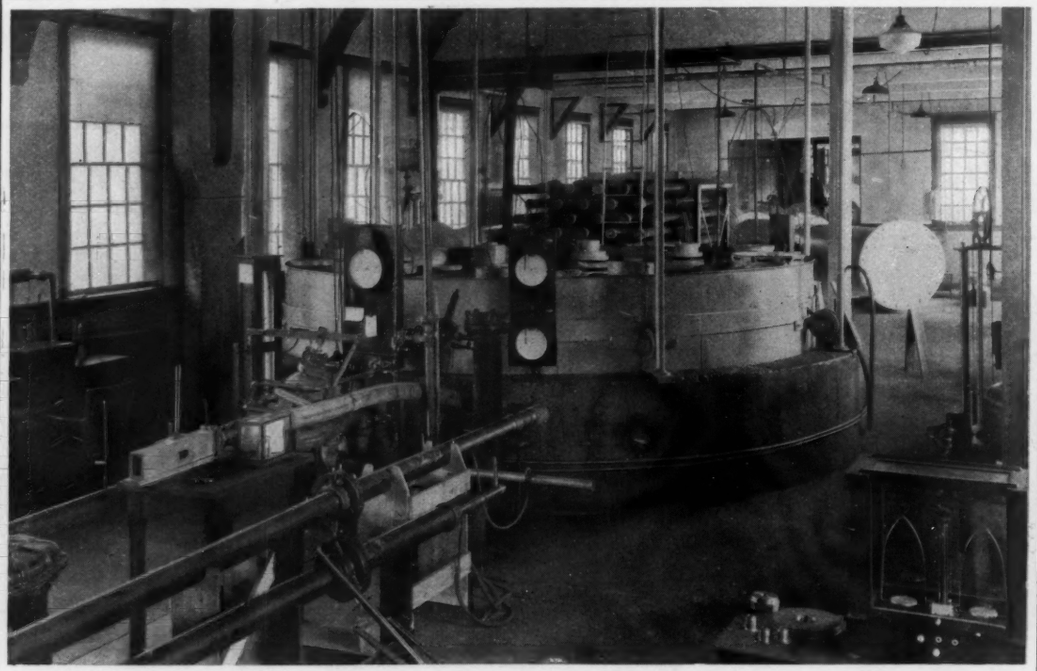
Chicago New York

MAXIMUM RETURN TO CLIENTS PER DOLLAR INVESTED

Another Great Achievement



DRESSER
COUPLINGS·DOMINATE



2200-foot prover and other equipment used in the Erie laboratory of American Meter Company

KNOWN FACTORS CUBIC FEET IN METER VALUE

Values in Gas Measurement

AMERICAN METER COMPANY
JOHN J. GRIFFIN & COMPANY
HELME & McILHENNY
MARYLAND METER WORKS
D. McDONALD & COMPANY
METRIC METAL WORKS
NATHANIEL TUFTS METER WORKS
PACIFIC METER WORKS

AMERICAN METER CO. MEASUREMENT ENGINEERS CUBIC FEET

The World's Largest Manufacturers of Gas Meters and Allied Apparatus

Established 1836

Any activity which may serve the more accurate, practicable or economical Measurement of Gas receives expert attention and full support in the conduct of American Meter Company factories.

This progressive policy in research is tempered by a conservative policy with regard to the introduction in standard products of changes that are not conclusively proved advantageous.

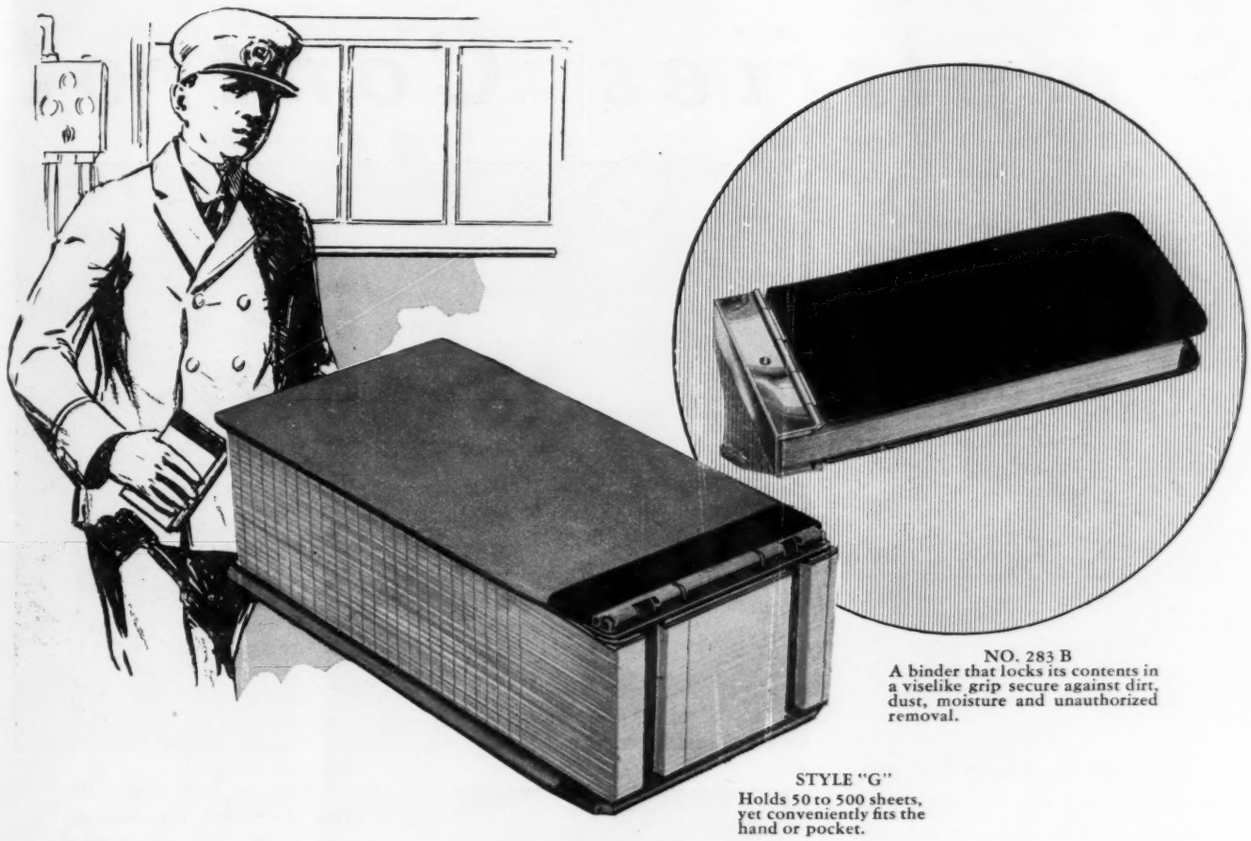
Only thorough test in practice can definitely establish "Known Factors in Meter Value."

A recent booklet descriptive of the Erie research laboratory shown above is available to Gas Company executives on request.

AMERICAN METER COMPANY

INCORPORATED

General Offices: 105 West 40th Street, New York City



NO. 283 B
A binder that locks its contents in a viselike grip secure against dirt, dust, moisture and unauthorized removal.

STYLE "G"
Holds 50 to 500 sheets, yet conveniently fits the hand or pocket.

Meter Readers' Binders

. . . that protect your records

GIVE your meter readers' records the best protection possible . . . Baker Vawter-Kalamazoo Binders. Records prepared in damp, dark cellars, carried about all day in all kinds of weather by careless meter readers . . . is it any wonder they often reach the office too illegible to record?

Public utility companies are universally adopting these neat, compact, protecting binders for meter data. Made in several styles, compact enough to fit the pocket, yet holding 500 sheets, and others with positive lock protection, specially designed to meet specific problems. These binders will outwear use and weather. The entire contents or single sheets may be quickly removed, facilitating bookkeeping duties, yet their high compression binding eliminates any possible loss of data while in transit. Why run a chance of lost or illegible records? Your local Remington Rand man will demonstrate these binders at your convenience and without obligation. Phone him today.

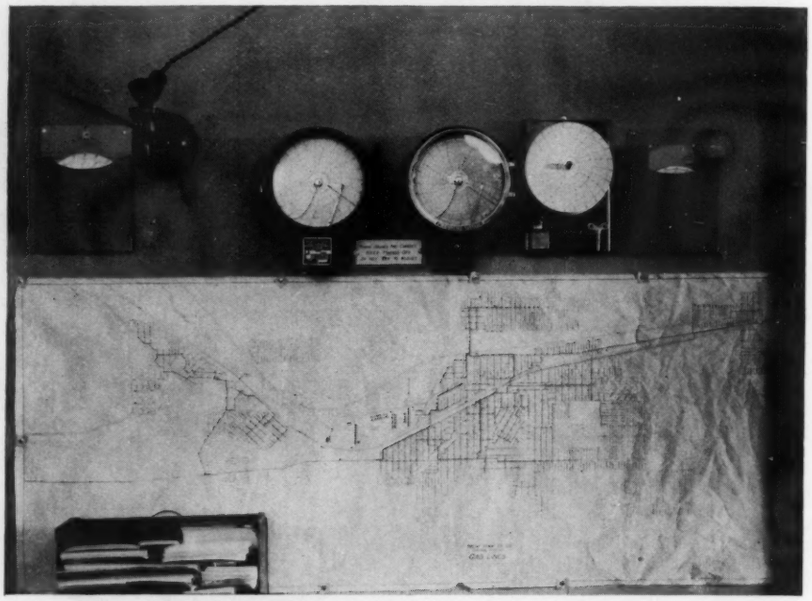
Baker Vawter-Kalamazoo

Division

Remington Rand Business Service *Inc.,* Buffalo, N. Y.

Branch offices in all principal cities

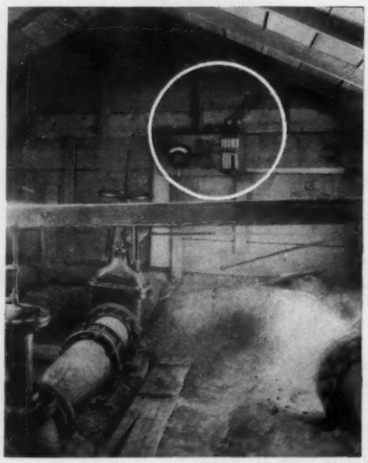
Simplifies Control of Pressure in the Gas Distribution System



Instrument at left is the Receiving Recorder, conveniently mounted on wall at central plant.

Conditions in all parts of high pressure gas distribution systems can be instantly and accurately checked from the superintendent's office by use of Bristol's Long Distance Transmitting and Recording Equipment.

This Bristol's Equipment consists of two instruments: a transmitter, and receiver (the latter usually a recorder), electrically connected. The transmitter is installed at the point where measurement of pressure is desired and the receiving instrument mounted on wall or panel at central plant, superintendent's office, etc. Can be furnished to operate over a few hundred feet or even several miles.



Transmitting Instrument installed in outlying station on high pressure gas line.

As shown in accompanying illustration for example, the transmitter (in lower illustration) is installed in outlying station and the receiving recorder (above) is conveniently mounted in central office. Such an arrangement permits the superintendent to tell at a glance whether correct pressures are being held. Any change in pressure is immediately recorded on the receiving instrument chart. Should a break occur in high pressure main the record line on the chart indicates not only approximately where, but the exact time at which the break appears, thus facilitating repairs and insuring uninterrupted service.

Likewise Bristol's Long Distance System can be installed to provide a continuous check on intermediate main pressures, efficiency of booster stations, pressures held at end of line, etc.

Complete information about Bristol's Long Distance System, together with prices, etc., contained in Catalog No. 1900. Write today for a copy.

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Dallas, Texas
Phone 2-8708

447 Sutter Street
San Francisco, Calif.
Phone GArfield 2772

Publication Office, 124 West Fourth Street
Los Angeles, Calif. Telephone TUcker 8982

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Publisher

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Managing Editor

ELLIOTT TAYLOR
San Francisco Manager

CRAIG ESPY
Mid-Continent Manager

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IN EVERY kind of competition you can single out a name that stands for undisputed leadership. In sport it's the name of the champion. In business it's the name of the organization that best meets the needs of those it serves.

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Why? Consider the development of the new Foxboro Orifice Meter. Tested through every kind of severe service before offered to the industry. Placed on the market to meet the demand for a more accurate, powerful and dependable Orifice than was ever built before. Accepted almost overnight by leading oil and gas engineers. Thousands sold in two short years.

Read the answer to Foxboro leadership in the record of the new Foxboro Orifice Meter—**first** choice of the experienced field or office man.

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You can't keep a good meter down! When oil men knew they could get a float type differential recorder that offered (1) no inherent error—no field calibration needed, (2) a powerful float unaffected by dirt, (3) ease of reading . . . cleaning . . . zeroing, (4) quick assembly, (5) low maintenance cost, they knew they had a winner. **Their reorders proved it!**

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Agents for Robinson Patented Orifice Flange Fittings

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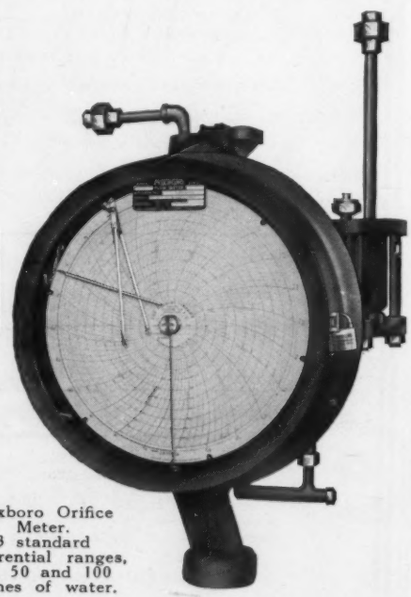
THE COMPASS OF INDUSTRY



Foxboro Orifice Meter. 3 standard differential ranges, 20, 50 and 100 inches of water.

Instruments for Controlling, Recording and Indicating Temperature, Flow, Humidity and Pressure

WESTERN GAS

"Reg. U. S. Pat. Off."

A Monthly Journal of the Gas, Gas Appliance and Natural Gasoline Industries in *Western America*

SAN FRANCISCO **LOS ANGELES** **DALLAS**

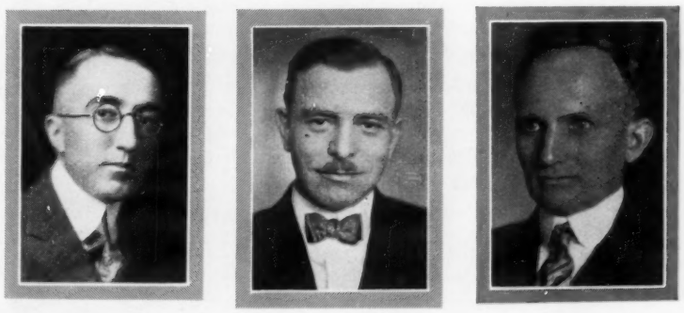
The West Coast Industry Speaks

Radio and Trade Press Campaigns Now Definitely Prepared—Read Text *of* First Broadcast, Which Goes *on* Air August 14, 10:50 A.M.

By ELLIOTT TAYLOR

San Francisco Manager, WESTERN GAS

GOOD MORNING EVERYBODY: That's the way it will start, and as a few hundred thousand women settle back to listen to the pleasing voice of Helen Webster broadcasting the first continuity of the Pacific Coast Gas Association's cooperative advertising campaign, a few thousand gas men will say, "Well, Well, Well." And well they may. For here, at last, is the tangible consummation of a plan that has been occupying the attention of advertising men, publicity men, new business men, managers of gas sales and other executives of the Pacific Coast gas companies for years.



Pacific Coast Gas Association Committee on Cooperative Advertising. Left to right: J. Charles Jordan, Pacific Gas and Electric Company, San Francisco; F. H. Holden, Southern California Gas Company, Los Angeles; D. L. Scott, Los Angeles Gas and Electric Corporation, chairman.

Every convention has heard snappy talks, has read convincing arguments, has considered alluring prospectuses on the subject of a general advertising compaign for the gas industry, and despite a unanimity of opinion that has always existed on the advisability of doing something—the great question has never before been decided definitely—*do what?*

And its companion problem was to be considered too—"what will we use for money?" For it stands as axiom one in every problem requiring the expenditure of funds, that the funds first be procured. But the gas industry of the Pacific Coast has untied the purse strings; the present campaign is definitely on paper; cooperative messages to homes and industries of the coast are scheduled ahead for six months making use of two of the greatest of modern advertising media—radio and the trade press.

CAMPAIGN SLOGAN

Before the month is out the campaign slogan will have begun to wear its way indelibly into the minds of radio listeners-in and readers of business publications—"The Modern Fuel—GAS—quick, clean, sure."

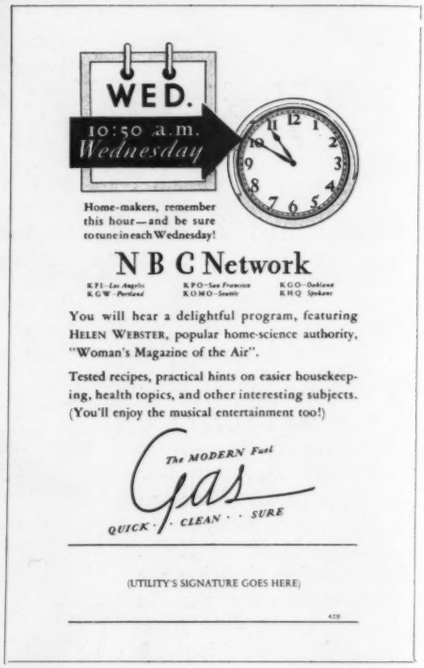
Beginning August 14 Pacific Coast Gas Association programs will be broadcast every Wednesday at 10:50 A. M. over the National Broadcasting Company's Pacific Coast network, consisting of stations: KFI (Los Angeles), KPO (San Francisco), KGO (Oakland), KGW (Portland), KOMO (Seattle), and KHQ (Spokane). During the same six-month period a half dozen or more industries will read full page gas advertising messages in their own trade press.

There is an aspect of adroit specialization of appeal that amounts almost to intimate friendly contact in the entire plan as it has been worked out, and while it seems a far cry from the kitchen of the home to the heating apparatus of industry, both fields are being approached with a directness and a specialization of message to audience, which should go far toward carrying the campiagn to success.

In many respects the cooperative advertising now to be undertaken differs from any advertising effort that any of the gas companies have ever expended. Most advertising and publicity contacts of individual gas com-

AT LEFT:
Easel-back display card for use in windows and on counters of gas companies and appliance dealers. These cards are available in two styles and sizes, with same copy, the one illustrated being 10¾ inches wide by 6¾ inches high.

BELOW:
One of the newspaper advertisements designed for use by cooperating gas companies over their own signatures, as a tie-in with the radio programs. The copy shown is for 2-column 8-inch display.


WED.
10:50 a.m.
Wednesday
Home-makers, remember this hour—and be sure to tune in each Wednesday!
N B C Network
You will hear a delightful program, featuring HELEN WEBSTER, popular home-science authority, "Woman's Magazine of the Air".
Tested recipes, practical hints on easier housekeeping, health topics, and other interesting subjects. (You'll enjoy the musical entertainment too!)
The MODERN Fuel
Gas
QUICK · CLEAN · SURE
(UTILITY'S SIGNATURE GOES HERE)

panies have in the very nature of things been made by the well traveled route of the printed word. Through this time proven medium much good has been accomplished—and will continue to be accomplished—for the cause of gas. Now, however, word-of-mouth is being summoned to supplement the year-round printed appeal.

Air lanes are not limited to any single utility's system, and use of radio by individual gas companies has therefore been handicapped. Coast-wide radio appeal, with attendant economies, is the solution which now brings this powerful modern weapon into action for gas utilities.

Now women will hear gas *talked* in terms of their own individual kitchens, by a voice in their own homes, a voice that they already know, through its connection with other programs that they have learned to follow in the N.B.C. "Woman's Magazine of the Air."

It is surprising to note, in this connection, that advertisers using radio universally report that the announcer is looked upon as a personal friend by the women in her audience. Women, writing to another woman whom they have never seen, refer to intimate details of their homes and their domestic problems with an amazing frankness. The housewife is prepared to listen to, and to a large extent place confidence in, a message thus brought to her. Twenty-six consecutive P. C. G. A. gas talks should build up a big fund of consumer confidence in the ideal fuel.

This advertising "rough" suggests the forcible copy which will reach the baking industry of the Pacific Coast through its trade media.

THE INDUSTRIAL UNIT

Hitherto gas companies have been hampered in advertising to individual industries through the medium of trade publications, for no one utility could economically use trade media which circulate over the whole coastal area. Co-operative advertising comes forward to solve this dilemma, and now the man in business will be approached from a familiar, if not indeed a confidential angle, through his own trade magazines. He will not be assailed with a general advertisement, heralding gas as the super fuel for every industrial purpose. This may be the truth, but its weakness lies in its generality. Here a few industries have been selected—industries that the committee feels represent the best or the most accessible potential market, and they will be reached with highly specialized, technical advertising copy. The machinery and metal trades will read messages talking in terms of their own business, not referring vaguely to it in company with baking and plumbing and all other trades that might possibly be gas users. Trades or industries thus covered will include: Machinery, baking, restaurants and hotels, confectionery, plumbing and heating, and building. All of these advertisements will be in full pages and will run for six months concurrently with the radio broadcasting.

In so far as it is possible to judge the results of any advertising campaign by rule of thumb method, the results of the radio appeal to housewives will be checked by the free distribution of a cook book in response to requests from radio listeners. This book has been especially prepared for this purpose and deals with general information on gas appliances, their care and operation, in addition to the usual contents to be expected in a cook book. Copies distributed will bear the imprint of the individual gas company on whose mains the gas user is located.

The advertising in the trade press,

(Continued on Page 54)

Gas Voice to be on the Air August 14; Here Is Text of Message:

On this page appears the full text of the first Pacific Coast Gas Association broadcast—one of 26 which Helen Webster, Home Science Editor of the N.B.C. "Woman's Magazine of the Air," will send over Western air lanes every Wednesday at 10:50 a. m.

ABOVE: Front cover of recipe book prepared for radio campaign by Pauline Partridge, home economics authority. Booklet is in two colors throughout, with green and white cover; it contains 48 pages of menus and recipes, with last 8 pages devoted to gas information.

GOOD MORNING EVERYBODY!

This morning we are just going to get acquainted with this new Woman's Magazine of the Air feature and with each other. I wouldn't dream of attempting any more right at the start, any more than if, the first time I came into your house, I'd burst out and confide in you all of the shortcomings of my family and my own grievous errors. That's no way to begin!

Instead we'll just talk generally about home—and in spite of all that the feverish writers and speakers of today say about the home's decline and the family's determination to toboggan right down to the bow-wows, *I* believe that home is becoming a more delightful and more appreciated place every day.

Two things contribute to this; one, people's better understanding of themselves and others; their realization that courtesies should not stop at their own front doors, and also the increasing intelligence with which adults now treat children is a big factor in this clearer, more *honest* home atmosphere. The second factor is due to those marvellous engineers, scientists and inventors of today who are wiping drudgery off the household map.

That was one of the things that made it hard for the woman of a generation ago to greet the family at night with a smiling face. (Sometimes she was so tired at the end of a day that it was even an effort to greet them with a *clean* one!) Drudgery—no other words for it, ceasless stove-stoking and water-heating; countless trips to the cellar after the things that had to be kept cool, back-breaking Mondays and Tuesdays when enormous washings and ironings were turned out by one back and one pair of hands . . . It's no wonder that the advent of the delicatessen store in the early nineties was greeted by many so-called "shiftless" housewives with far more enthusiasm than its products warranted. It wasn't laziness that drove most of these women to the delicatessen, it was the mysterious working of the law of Self-Preservation.

My own theory is, that if "the home" survived all of this chainless slavery (as someone called it) we needn't worry about it deteriorating now that we have every comfort and convenience to make home a place of rest and joy to the mother of the family as well as to the father and the children. Mother doesn't lag behind the procession any more, carrying the wash board and the scrubbing brush—she's right up in front leading the whole parade, and the family is proud of it!

And these modern ideas in homemaking that I am going to tell you about do not mean a large establishment or tremendous expense. The smallest apartment or bungalow can house these magic helpers who daily cut down the hours indoors and in the kitchen and leave the wife and mother free for those other interests and outside contacts which keep her mind alert and preserve her health and best of all her enthusiasm.

For a home and family to live in this atmosphere means one thing chiefly: labor-saving devices. Just which of these should come first in a family's planning depends of course on the size of each family group and its particular needs. Finances necessarily play some part too—but as a rule there is equipment on the market to suit every taste and every purse. Everyone today doesn't own the same type radio or automobile and in some instances a choice has to be made between one and the other, but you can be sure that one or another is to be found there or is being planned for as speedily as possible.

So too, there should be a good, modern gas range, a washing machine, a vacuum cleaner and automatic gas water heater and gas refrigerator to still further lighten the domestic burdens and give more leisure to enjoy the radio, the out-of-doors and the books and garden.

How far ahead we are in our homes today compared with even five years ago! What wonderful discoveries are being made every day! And to acquaint you with these new devices and new discoveries this series of talks has been prepared. We will tell you of the modern tools and modern methods by which mothers and wives today are becoming more truly "home makers" and less slaves and drudges.

These talks will be on the air at this time each Wednesday morning and are presented to you through the courtesy of your own gas company which hopes in this way to provide you with a service more far reaching than its simple, primary responsibility to furnish you with that most perfect of all fuels—gas.

(Continued on Page 52)

Heat Treating Furnace Design

By J. H. GUMZ

Industrial Gas Engineer
*Pacific Gas and Electric Company**

HEAT treating furnaces involve a multitude of types, designs, and sizes dependent on the material being heat treated. Heat treating itself necessitates furnaces ranging in temperatures from 200 or 300° F. for tempering and drawing to approximately 2600° F. for hardening high speed tools. If this range in temperature was all that was involved, the problem would be comparatively simple, but the problem of heat treating is further complicated by the use of various mediums in which to do tempering and hardening—oil, lead, salts, etc.; and then we have the problem of carburizing or case hardening, whether by means of a char compound, cyanide or gas. Various furnace atmospheres—oxidizing, neutral and reducing—also further complicate the problem.

The rapidity with which the art of steel treating has advanced has made obsolete some information which in recent time was generaly accepted. This rapid change and progress has also had the effect of making old-fashioned in their methods many operators and shopmen who only a few years ago were considered foremost in their work.

AUTO AND PLANE REQUIREMENTS

Two things have given more impetus to the advancement of heat treating than almost anything else. The improvement and refinement of the automobile and, more recently, the requirements of the airplane manufacturers have demanded better and more exacting work than ever before. Without the advance of heat treating during the past 20 years, Lindbergh's flight and more recently that wonderful accomplishment of the army plane "Question Mark" would have been impossible. And yet it is only recently that I watched a man making leaves for broken automobile springs in an open blacksmith forge fire. He was satisfied that he was doing a good job. That incident may be amusing, but how about the railroad shop that was annealing 12-foot locomotive connecting rods in a furnace nine feet long? One end of the rod always stuck out of the furnace door. Rapidly this condition has now been corrected and every effort is being made to heat treat in accordance with recommended practices.

To many, the design and construction of a heat treating furnace may appear a simple thing. In fact, so simple does it

J. H. Gumz

appear to many that it is nothing extraordinary for a general handy handy man or bricklayer to be given instructions to build a furnace. This applies to fuel-fired furnaces, but not to electrical furnaces. No one would think of calling on the ordinary wiring contractor to build an electrical heat treating furnace and yet there are many otherwise capable plant executives who do not hesitate to call in a bricklayer to construct a fuel-fired furnace.

The design of heat treating furnaces involves more than merely the furnace itself. Modern methods of manufacture must always be considered to determine just what type of furnace will prove most economical. Some of the questions that this involves are as follows: Is the furnace to be in line of production? Is it to be a continuous furnace or a batch type? How many hours will it operate?

As a general rule, continuous furnaces are only practical where the volume of production is such as to permit operation for long periods of time. Usually, too, the material being heat treated must be rather uniform in size, shape, etc., to enable the furnace to operate at its best. In plants having a great variety of parts with a limited number of each to be heat treated, a batch type furnace is usually satisfactory. This also applies to the heat treating shop doing a jobbing business. It is peculiar that many shopmen feel that a continuous furnace will solve all their problems and at the same time be an economical appliance to operate. The fact is often overlooked that man power is required to feed the continuous furnace and in some cases to unload it, and that unless care is taken these men are idle a very considerable portion of the time. With the batch type furnace, loading and unloading various furnaces can be so programmed that a minimum of man power is required. As has been said, the foregoing applies to smaller shops, but even so there are exceptions.

In one instance a shop wished to harden the ends of small forgings approximately six inches long, the end to be hardened being about 1½ inches wide and ¼-inch in thickness. The other end was threaded and it was desired that it remain unhardened. The practice was to place the ends of the forgings in the opening of a small forge furnace until they reached the required temperature and then remove them and quench them in water. One man could harden about 2000 forgings a day by this method. Necessity of increasing production to about 10,000 per day made obvious at once the fact that the hardening procedure being followed was slow and costly. A study indicated that about 1½ minutes were required to bring the ends of the forgings up to hardening temperature. A production of 20 per minute meant that if each forging was to be heated two inches (allowing a margin for safety) a furnace which would hold 40 pieces at a time was necessary. This established a furnace length of 40 inches, as each forging required one inch space. To place 20 forgings per minute in a furnace and quench an equal number under the existing procedure was impossible, so a small furnace was designed with a conveyer to carry the pieces through the heating zone in such a manner that they would drop automatically into the quenching batch when carried through the furnace. The furnace interior was made 4 inches wide, 4½ inches high and 45 inches long. Five gas burners fired directly on the ends of the forgings, but as they were moving they were in the direct flame only a few seconds at a time and the total time in the furnace, 1½ minutes, did not permit of an appreciable amount of scale formation or burning. Actual timing of the rate at which the pieces were run through the furnace showed that over 1400 pieces were hardened per hour. The man doing the work did not work as hard as he had to harden 2000 per day previously and the fuel used was the same. Briefly, production was increased 500 per cent without any increase in cost other than an investment of about $600 for the new furnace.

*Delivered before the 1929 Western Metal Congress.

Mention has been made of burners firing directly on the work being heat treated. In general practice this is decidedly not the thing to do. In the case mentioned it worked out satisfactorily, but it was an exception. Direct heat application results in spot heating and non-uniformity of heating; in other words, the surface of the material being heat treated may be overheated while its interior is still relatively cold. Annealing, hardening, and drawing furnaces should be so fired that there is little or no danger of the flame coming in contact with the material being heat treated. In small furnaces, this is quite readily accomplished by having burners fire under a hearth on which the work rests. The burners firing from both sides of the furnace should give a uniform temperature provided care is taken to have a sufficient number of burners to evenly distribute the heat through the length of the furnace. It is well established that a homogenous mixture of gas and air in proper proportions for complete combustion will burn with a very short flame. Such a flame may develop a temperature closely approaching 3400° F. Obviously, it is unlikely that a large furnace can be heated up uniformly and maintained with any predetermined temperature in all parts of the furnace if all the heat is supplied from one point or burner. Therefore, a multiplicity of burners is desirable, the limit being dependent on the requirements of the work and the cost of the furnace. Assuming that a furnace is fired under a hearth, the material being heated will receive heat in three different ways: By conduction through the hearth, by radiation from the walls and arch, and by contact of the hot products of combustion themselves. Just which of these is the most important it is difficult to say, but it is probable that heating by radiation and convection is more important than heating by conduction. The bulk of material being heat treated is of such design and shape that relatively small areas of the total surface actually come in contact with the hearth. In muffle furnaces, of course, convection heating is at a minimum and in semi-muffle furnaces with high side walls the same is largely true. Considerable thought should, therefore, be given to the direction of radiated heat so that the material receives the maximum amount. Uniformity of heat is one of the most important problems involved in the design of salt baths. Excess or spot heating breaks down many of the salt compounds now being used and also results in short pot life. It is probable that a muffle wall around a salt bath will overcome many of the difficulties now encountered in this type of furnace.

In the larger heat treating furnaces of the car bottom or conveyor type, it is often impractical to heat under a hearth. It then becomes necessary either to heat from the sides by means of radiant refractory beds or from burners supplying the heat directly below and to the arch. Here again a few burners can cause trouble due to spot heating. Supplying heat to a furnace across the arch brings up another problem—that of venting. If a furnace fired at the arch is vented through the arch, the hearth is almost certain to be lower in temperature than the top of the furnace. To somewhat correct this, vents should be taken off at the hearth level. And the question naturally arises, where at the hearth level. The answer is, preferably at the points of greatest heat loss, the doors or ends. Even when this is done, it may be found necessary in long furnaces to further compensate for heat losses at the ends of the furnaces to increase the burner capacities immediately adjacent to the door or ends. In this connection, it is recommended that any one designing a fuel fired furnace can profit exceedingly by studying the book, "Flow of Gases in Furnaces," by Groume-Grjimailo.

One furnace designed for making and heat treating locomotive and car springs has proven eminently satisfactory through five years it has been in use. The furnace is approximately 4 feet by 6 feet in size, fired from two sides across the arch. There is a door 18 inches wide at each end, but these doors are not opposite each other. There are no vents in the furnace. When heating up, the doors are raised about an inch, but, when up to temperature, the cracks around the door provide just enough vent area for the fuel burned. The construction is 9-inch fire brick with 4½ inches insulation all around. Testing with an eptical pyrometer, there is not a variation of 25° in any part of the furnace. The only maintainence expense on the furnace in five years has been to relay the hearth, which became badly worn by sliding work in and out.

Speaking of heat losses through doors brings to mind a furnace which was in operation last summer and may still be doing its share to discredit the art of heat treating. A large corporation built new shops within the past two years. An 8-foot annealing furnace fired with two oil burners was purchased and erected and within about six months the arch fell in. The doors at each end also were badly burned. The arch was easily replaced but the doors were not so easy to remedy. To permanently solve the problem, some one conceived the idea of making a door of steel plate in the form of an open tank the width and height of the original doors and about three inches through. Water was run into the bottom of this tank and an overflow at top discharged the heated water to a sewer. The difficulty of burned out doors was solved, but one can imagine the effect of those two cold black ends on the work being heat treated.

In designing heat treating furnaces, the type of work being done and the size of furnace has much bearing on the kind of construction which should be used. If the furnace is to be used for heat treating small tools and parts for an hour or two at infrequent intervals the refractories used can be quite light, perhaps two or three inches in thickness, and insulation can practically be dispensed with entirely. What is wanted is a quick heat and the furnace may be shut down before the insulation begins to become effective. On the other hand, a furnace operating every day for eight hours should be heavily insulated and the refractories should be of the best and, depending on the size of the furnace, should be quite heavy. The heavy insulation cuts down radiation losses and thereby saves fuel and likewise keeps the furnace hot over night so that it can readily be brought back to temperature

(Continued on Page 48)

IN ITS September issue "Western Gas" will again publish advance papers and committee reports prepared for the Pacific Coast Gas Association annual convention—an invaluable source of information and reference covering the whole range of gas utility operation.

To mention only one report—the work of the natural gas transmission pipe line committee, summarizing best practice in pipe line design, will be published. It contains some 43 sub-topics and innumerable illustrations.

Additional copies of the September issue can be supplied only on advance reservation, at a cost of 50 cents each.

Flow *of* Natural Gas *through* High Pressure Transmission

A Joint Report *by* T. W. JOHNSON

Calculated Deliveries Checked Against Metered Tests; Results Indicate Close Agreement *with*

THE Bureau of Mines, in cooperation with the Natural Gas Department of the American Gas Association, has in progress a study of the flow of natural gas through high-pressure transmission lines. A major problem of this study is to compare the deliveries calculated from the gas pipe-line flow formulas commonly used, with the metered deliveries from pipe lines in operation. In order to obtain such comparisons a series of tests has been made on 25 operating pipe lines in Kansas, Oklahoma, Louisiana, Arkansas, Texas, and California.

SCOPE OF REPORT

This report includes discussions of the factors determining the selection of pipe lines for study, the method of making the field tests, the methods of calculation, the method of comparing the measured delivery with the deliveries calculated from pipe-line flow formulas, a table of the results obtained on 24 of the 25 operating pipe lines tested, and a discussion of representative tests and results.

Although the measured deliveries have been compared with the volumes calculated from all of the gas pipe-line flow formulas commonly used, such comparisons are confined in this report to the volumes calculated from Weymouth's formula.[1] The results of the present study showed that with conditions of steady flow and no obstructions such as condensate, sand, and rust the measured rates of delivery agreed more closely with the rates calculated from Weymouth's formula than with those calculated from any of the other formulas.

The discussions in this paper are limited primarily to consideration of steady rates of delivery. It is hoped that a continuation of the field investigations and additional experimental study will give more information on the effects of varying rates of delivery, of "packing" or storing gas temporarily in a section of line and the converse conditions of "unpacking" or drainage from that section of line, small pipe diameters, gas composition, and other factors which relate to the flow of natural gas through transmission lines.

Questionnaires were sent to natural-gas transportation companies requesting information on pipe lines available for the study of high-pressure transmission of natural gas. From these questionnaires, data were obtained on many pipe lines of different diameters, lengths, types of construction, and operating conditions. The selection of lines for this series of tests was based upon a study of these data.

All of the pipe lines used in this study were comparatively new. The operating and delivery records of the various companies showed that the amount of leakage from each of the lines selected was small and not in excess of that to be expected from new pipe lines in good condition. Where possible, the amount of leakage was determined by the "shut in" pressure drop method.[2] No regulators or other mechanical devices for reducing pressure were located in any of the sections of the pipe lines selected for testing. The effect of increased frictional resistance due to consolidated rust in the pipe was studied on two pipe lines. With these exceptions, the interior walls of the pipe in each case had the average smoothness of new commercial line pipe.

An attempt was made to obtain sections of pipe lines equipped with orifice flanges at the two ends so that the volume of gas passing through a section could be measured at both the inlet and outlet. In many sections, however, only one measurement of the rate of delivery could be made, since only one orifice flange was available.

In each test it was desirable to arrange periods during which the conditions of flow were steady, and other periods when both the inlet and outlet line pressures increased or decreased at the same rate. It was also desired that the chemical composition of the natural gas transported in the pipe line should remain the same during a test. Special precautions were taken to select pipe lines or sections of pipe lines where no gas entered or left the line between the inlet and outlet ends.

TESTING AND CALCULATING RESULTS

Preparation for Tests

A thorough inspection and survey of the pipe line was made before any flow observations were recorded. Special attention was given to the following:

1. Topography of the country traversed by the line.

1. Weymouth, T. R., Problems in Natural Gas Engineering. Trans. Am. Soc. Mech. Eng., vol. 34, 1912, pp. 1091-1104.

2. Rawlins, E. L., and Wosk, L. D., Leakage from High-Pressure Natural-Gas Transmission Lines. Bull. 265, Bureau of Mines, 1928, 108 pp.

*This paper represents work done under a cooperative agreement between the U. S. Bureau of Mines and the Natural Gas Department of the American Gas Association. Printed by permission of the Director, U. S. Bureau of Mines. (Not subject to copyright.) Authors: T. W. Johnson, associate natural gas engineer, U. S. Bureau of Mines, Petroleum Experiment Station, Bartlesville, Okla., W. B. Berwald, associate petroleum engineer, U. S. Bureau of Mines, Petroleum Experiment Station, Bartlesville, Okla.

Acknowledgements: Study of the flow of natural gas through high pressure transmission lines was made under the general supervision of H. H. Hill, former chief petroleum engineer of the Bureau of Mines, H. C. Fowler, acting chief petroleum engineer of the Bureau of Mines, N. A. C. Smith, superintendent of the Bureau of Mines Petroleum Experiment Station at Bartlesville, Okla., and R. R. Brandenthaler, chief of the oil and gas section of the Bartlesville station.

The investigation and presentation of results was carried on under the direct supervision of E. L. Rawlins, associate natural gas engineer, Bureau of Mines. R. R. Brandenthaler, petroleum engineer, Bureau of Mines, criticized the manuscript and made valuable suggestions for the presentation of results. Ben E. Lindsly, Bureau of Mines petroleum engineer, reviewed the manuscript constructively.

Thanks are due to the various operating gas companies who have permitted use of their pipe lines and furnished valuable assistance in the experimental work.

Lines

and W. B. BERWALD

Gas Flow *in* Series *of the* Weymouth Formula

2. Difference in elevation between inlet and outlet.

3. Number of line drips, type of drip construction, and the amount of condensate removed. All drips were blown daily during a test.

4. Number of river crossings with the size and length of pipe used and type of construction of each.

5. Condition of orifice plates. The orifice plates were inspected and only the orifices with edges in good condition and of known micrometered diameter were used. Wherever possible, the internal micrometered diameter of the pipe at the orifice was obtained.

6. Number and size of main-line gate valves.

The required data for a flow test on a transmission line consisted of the pressures at each end of the section being tested, rates of gas delivery, and temperatures and specific gravities of the flowing gas. The apparatus to obtain these data was selected for accuracy and practicability.

Measurement of Pressures

Since the rate of delivery as calculated by applying pipe-line flow formulas is based upon the difference between the inlet and outlet pressures, it is necessary to determine these pressures very accurately. A small percentage of error in the line pressure at the inlet or outlet may cause an appreciable percentage of error in the pressure drop between the inlet and outlet. The static pressures were measured with dead-weight gauges[3] in all of the flow tests, as a study of the accuracy of spring gauges proved that they were not sufficiently accurate for this work. The dead-weight gauges were made from ordinary dead-weight gauge testers, constructed to indicate the pressures directly by balancing with calibrated weights the pressure exerted against a small piston. They are very sensitive to pressure measurement and can be made to determine pressures to within 0.1 pound per square inch. The weights used with each of the dead-weight gauges were calibrated three different times. Their actual weights were determined with an analytical balance; then knowing the cross-sectional area of the piston in the gauge, the pressures in pounds per square inch which these weights exert on the piston were calculated.

Differential pressures at orifices were measured with a water manometer. This offered the best means of observing the differential pressure, since any change would be indicated more quickly on a direct-connected manometer than on the mechanical recording instrument. In order to withstand line pressures up to 600 pounds per square inch, a water manometer with specially designed stuffing boxes and high-pressure glass tubing was used.

Copper tubing and compression ring fittings were used to connect the water manometer to the proper taps. The location of these taps with respect to the orifice plate depended upon the existing installation at each of the orifice flanges; that is, whether they were 2½ and 8 pipe-diameter taps or flange taps. If 2½ by 8 diameter connections were used, the dead-weight gauge was connected to the upstream tap; if flange connections were used, the gauge was

3. Rawlins, E. L., and Wosk, L. D., Leakage from High-Pressure Natural Gas Transmission Lines, Bull. 265, Bureau of Mines, 1928, p. 8.

Table 1.—*Determining an average value for a series of observed readings.*

Time	Observed static pressure, pounds per square inch	Average static pressure, pounds per square inch	Time interval, minutes	Weighted value of static pressure readings
1:12	137.0			
1:16	137.0	137.00	4	548.00
1:20	136.9	136.95	4	547.80
1:24	136.9	136.90	4	547.60
1:28	136.9	136.90	4	547.60
1:32	136.9	136.90	4	547.60
1:36	136.9	136.90	4	547.60
1:40	136.9	136.90	4	547.60
1:44	136.8	136.85	4	547.40
1:48	136.8	136.80	4	547.20
1:52	136.8	136.80	4	547.20
1:56	136.8	136.80	4	547.20
			44	6,022.80

44 minutes —0.2 lbs. per square inch change in pressure

Mean weighted average static pressure = $\frac{6,022.80}{44}$ =136.88 lbs. per sq. in.

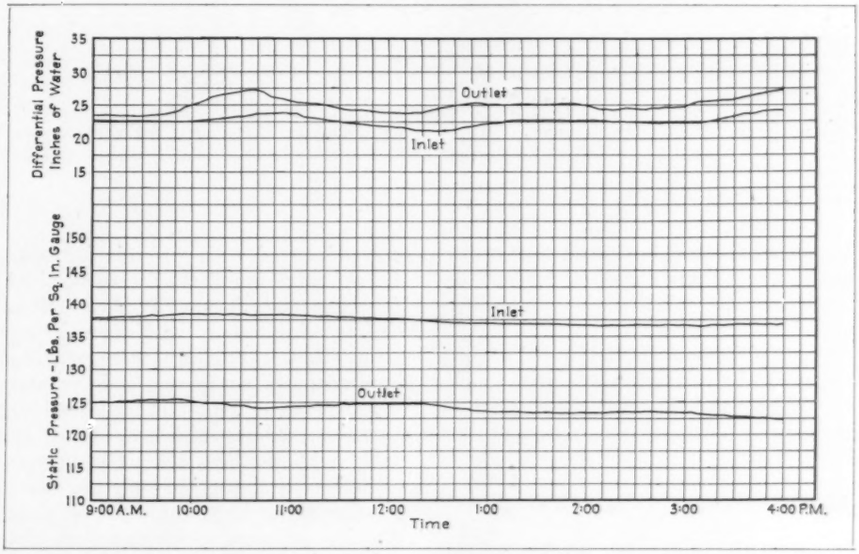


Figure 1. Record of pressure observations. Line "B." May 17, 1928

LINE	TEST No.	LOCATION OF LINE	DESCRIPTION OF PIPE: O.D. INCHES	I.D.* INCHES	WEIGHT PER FT. LBS.	LENGTH OF LINE TESTED MILES	TYPE OF JOINT	LENGTH OF TEST PERIOD: HRS	MIN	SPECIFIC GRAVITY OF GAS: AIR=1	TEMP. OF FLOWING GAS: °FAHR.	BAROMETRIC PRESSURE LBS. PER SQ. IN.: INLET	OUTLET	PRESSURES LBS. PER SQ. IN. ABSOLUTE: AVERAGE INLET PRESSURE (p1)	DIFFERENCE BETWEEN INITIAL AND FINAL P1	AVERAGE OUTLET PRESSURE (p2)	DIFFERENCE BETWEEN INITIAL AND FINAL P2	P1²-P2²	VOLUMES M.CU.FT. PER HR. AT 14.4 LBS. PER SQ. IN. ABSOLUTE AND 60° F.: METERED	METERED	CALCULATED FROM WEYMOUTH'S FORMULA	PERCENTAGE DIFFERENCE FROM WEYMOUTH'S FORMULA: INLET	OUTLET	REMARKS
A	1	Texas	22.00	21.500	72.383	38.02	Coupled	1	00	.693	63.0	14.67	14.58	174.15	+.7	161.84	+.5	17.31	1,289	1,353	+1,360	N**	-.5	* Listed by manufacturers. ** Less than 0.15 percent.
	2							1	00	.689	64.6	14.58	14.52	167.62	-.7	157.60	-.9	8.02	859	903	886	+.3	+2.5	Line traverses flat country.
B	1	Texas	18.00	17.500	47.393	24.73	Coupled	1	44	.587	74.0	14.64	14.71	151.71	-.3	139.39	-.1	13.42	770	776	769	N**	+.3	Uniform flow conditions.
	2							1	40	.587	72.5	14.63	14.72	151.97	-.3	151.49	-.3	10.04	721	734	720	N**	+1.0	Line traverses flat country.
C	1	Texas	18.00	17.438	48.123	27.047	Coupled	1	28	.746	83.6	14.38	14.28	217.92	-4.4	208.80	-4.4	24.19	1,445	1,536	1,578	-8.5	-2.5	
	1							2	00	.740	83.0	14.23	14.13	1,598.53	-7.5	280.72	-7.7	18.11	1,485	1,561	1,548	-5.5	-.5	Wide range of flow conditions.
	3							1	00	.745	83.6	14.30	14.20	302.34	-.7	281.13	+.3	21.31	1,465	1,568	1,455	+6.0	+6.0	Line traverses rolling plains.
	4							1	00	.743	84.1	14.30	14.15	330.58	-1.0	329.42	-.7	17.16	1,419	1,484	1,439	+4.0	+2.5	
	5							43	30	.750	86.0	14.32	14.22	331.46	+2.0	317.07	+2.0	14.39	1,180	1,139	1,230	-6.5	-10.0	
D	1	Okla.	16.00	15.402	47.668	22.738	Welded	1	5	.798	67.1	14.78	14.78	183.74	+.5	151.19	+.3	15.65	650	682	633	+2.5	+3.0	Uniform flow conditions.
	2							1	00	.772	63.0	14.72	14.92	156.17	+1.0	117.80	+1.0	13.57	606	601	591	+2.5	+1.5	Line traverses hilly country.
	3							1	00	.768	67.6	14.72	14.15	134.78	-1.9	111.61	-1.7	11.13	631	661	650	N**	+8.0	
E	1	Okla.	16.00	15.50	47.093	18.308	Coupled	1	00	.784	61.4	14.31	14.71	200.66	-.2	197.87	+.1	7.79			499	421		-18.5		Rust and condensate in the pipe line.
	2							1	00	.786	62.0	14.01	14.07	219.74	-.4	217.84	-.3	6.90			498	415		-18.5		Traverses hilly country.
F	1	Okla.	16.00	15.375	52.357	11.534	Coupled	1	00	.805	72.0	14.98	14.37	130.52	-2.6	118.81	-3.1	1.71			384	380		-7.0		Delivery was small
	2							1	00	.804	68.0	14.57	14.50	130.55	+1.8	119.90	+1.8	.89			369	375		-7.0		
G	1	Calif.	18.00	14.50	98.41	22.51	Welded	26	00	.635	62.0	14.76	14.34	864.57	-.3	511.28	-.3	463.24			2,360	2,275		-1.5		Large delivery.
	1							1	00	.633	61.5	14.83	14.37	883.99	+3.1	528.07	+3.1	464.21			2,330	2,268		-1.5		Line traverses mountainous country.
H	1	Calif.	12.75	12.325	28.44	48.955	Welded	82	00	.633	53.0	14.86	14.90	276.39	-.4	148.33	-.4	127.07			1,481	1,434		N**		Line traverses semi-rugged
	2							36	00	.639	54.7	14.77	14.13	278.61	-9.6	146.43	-3.8	128.18			1,481	1,423		+7.0		country.
I	1	Texas	12.75	12.188	27.433	83.967	Coupled	80	00	.598	82.0	14.27	14.34	458.76	9.0	372.23	0.0	284.05	1,548		1,169	+18.5		Line traverses rolling plains.
	1							1	00	.589	82.4	14.30	14.35	467.39	-.4	378.10	-1.2	144.78	1,581		1,189	+18.0		
J	1	Texas	12.75	12.15	53.073	18.433	Coupled	82	00	.564	79.3	14.76	14.64	484.36	0.0	423.51	0.0	60.85			774	1,323		-41.5		Condensate in pipe line.
	1							81	00	.564	79.3	14.76	14.66	470.99	-1.6	427.70	-1.8	43.29			799	1,370		-41.5		Line traverses rolling plains.
K_1	1	Texas	12.75	12.188	27.433	18.019	Coupled	1	00	.567	75.0	14.83	14.79	465.64	-.1	463.97	-.1	1.67			137	274		-8.0		Line in operation three days
	2							1	00	.561	75.0	14.81	14.74	477.44	+3.7	468.07	+3.7	3.37			309	318		-4.0		before test was made.
K_2	1	Texas	12.75	12.188	27.433	34.644	Coupled	1	00	.562	78.0	14.88	14.87	486.30	-1.5	481.53	-1.5	9.77			346	360		-4.0		Traverses flat country.
	2							1	00	.567	74.8	14.90	14.84	487.80	-.5	483.80	-.5	3.70			341	357		-4.5		Section K_2 includes K_1
L	1	Kan.	12.75	12.090	43.77	16.402	Welded	1	00	.592	75.0	14.34	14.28	155.34	+1.2	138.31	-.3	16.83			389	389		+4.0		Line traverses flat prairie
	1							1	00	.587	75.0	14.34	14.28	154.01	+1.9	137.41	+1.8	16.46			385	378		+1.5		country
	3							14	30	.585	75.0	14.34	14.27	177.98	+1.8	157.38	+1.8	20.60			385	370		+2.5		
M	1	Calif.	10.79	10.136	58.058	18.439	Welded	48	00	.639	62.0	14.13	14.34	248.42	-11.6	201.47	-11.4	48.85			507	572		-11.5		Condensate in line. Traverses
	5							31	00	.678	59.8	13.87	14.10	270.03	0.0	210.87	-.7	59.06			197	227		-28.0		rugged country for N. 1% length.
N	1	Okla.	10.79	10.250	58.058	7.58	Coupled	55	00	.588	68.0	14.97	14.37	200.21	+.1	188.08	+.1	12.44			189	383		-48.0		Rust and dust in pipe. Line
	1							50	00	.590	67.0	14.78	14.59	177.08	+.4	164.21	-.3	12.82			181	353		-47.5		traverses flat country.
O	1	La.	10.79	10.192	31.201	8.83	Screwed	1	15	.691	77.9	14.60	14.87	262.81	0.0	246.21	0.0	33.54			858	875		-4.0		
	2							1	00	.677	86.5	14.61	14.80	269.15	+.4	253.44	-.8	28.17			867	887		-2.5		Line traversed low rolling
P	1	La.	10.79	10.192	31.201	61.72	Screwed	20	00	.607	68.8	14.95	14.73	281.58	0.0	415.89	0.0	153.91	821			975	-11.0		country. Originally laid as an
	2	and						1	00	.607	64.5	14.86	14.67	280.15	+3.8	430.19	+3.7	151.47	714			869	-18.0		oil line but never used as such.
	3	Ark.						40	40	.607	84.5	14.85	14.73	280.31	-.8	416.86	+.4	164.25	821			971	-11.0		
Q	1	Calif.	8.625	8.125	22.361	8.254	Welded	1	15	.692	72.9	14.82	14.17	164.28	+.8	84.55	+.8	66.98	447			434	+3.5		Line traverses flat country.
	1							40	00	.692	68.7	14.59	14.93	101.37	-3.8	74.59	-3.7	17.98	321			223	+44.0		Pressure at inlet very unsteady.
R	1	Calif.	8.625	8.125	22.361	11.867	Welded	1	00	.709	56.5	14.88	14.78	182.08	-3.2	109.85	-3.0	42.40			295	278		+6.0		Line traverses flat country.
	2					12.734		1	00	.710	67.0	14.84	14.81	134.91	+4.0	81.58	+4.1	47.33			260	248		+5.0		
S	1	Calif.	6.625 6.625 6.625	6.186 6.125 6.125	15.048 19.185 19.185	1.004 13.761 11.437	Welded	86	19	.663	64.5	14.57	12.74	211.00	-.7	160.85	-.7	180.05	418			398	+5.5		Line traverses rugged mountainous country.
	2							83	23	.731	66.0	14.81	12.69	213.07	-.8	181.42	-.6	131.45	391			381	+7.5		
T	1	Kan.	8.625	8.063	28.062	2.517	Welded	1	00	.710	66.8	14.14	14.20	143.05	-.7	141.83	-.9	1.22			83	88		-5.5		Line U consists of lines T and V. Length of line U equals length of line V plus equivalent length of line T. Line traverses flat country.
	2							40	30	.710	69.1	14.13	14.16	147.71	-3.1	144.65	-2.8	1.26			86	91		-5.5		
U	1	Kan.	8.625 6.625	8.063 6.125	28.062 17.021	2.517 14.305	Welded	1	39	.710	67.1	13.90	14.06	113.00	-2.5	89.68	-4.0	23.32			85	75		+13.5		
	2							1	00	.708	74.0	13.86	13.88	115.11	-1.2	106.78	-1.4	8.93			80	72		+11.0		
V	1	Kan.	6.625	6.125	17.021	14.353	Welded	3	33	.708	67.0	13.88	14.09	136.67	-2.4	107.27	+.7	19.60			86	76		+13.0		
	1							1	00	.708	72.5	13.88	14.09	137.09	-.4	107.51	-.3	19.57			86	76		+13.0		
	3							40	30	.710	67.0	13.88	14.01	181.23	-.9	133.45	+.4	17.80			89	80		+11.5		
W	1	Okla.	6.625	6.84	18.78	17.184	Welded	30	00	1.044	75.0	14.18	14.20	302.30	-.6	167.10	-.7	35.80	139			110	+17.5		Line traverses rolling country.
	2							15	00	1.038	81.0	14.09	14.11	318.84	+.1	168.86	+.1	43.78	167			132	+20.5		
	3							44	00	1.040	75.0	14.20	14.20	300.17	-.5	164.33	+.1	39.83	154			118	+15.5		

Table 2. Results of tests on flow of gas through pipe lines.

connected to the downstream tap; orifice coefficients in each case are based on static pressures taken at the points mentioned.

Aneroid barometers, calibrated against mercurial barometers, were used to obtain the barometric pressures at the inlet and outlet points of the section of line being tested.

Measurement of Temperatures

The temperatures of the flowing gas were determined with a calibrated mercurial thermometer inserted in a steel thermometer well filled with mercury or oil and extending into the flowing gas.

The specific gravities of the natural gas were determined with a Pierce Improved Edward's Gravity Balance. This is a suspension-type balance with the balance rod and float fulcrumed on knife-edges.

The volume of gas passing through the line was determined by orifice measurement. The static pressure, differential pressure, barometric pressure, temperature, and specific gravity observations obtained by the methods previously mentioned were used in the calculation.

Procedure of Testing

Before any readings were recorded, all connections were subjected to line pressure and tested with soapsuds for leaks. If leaks were found they were repaired. If orifices were located at both ends of the line being tested, the differential and static pressure readings were recorded simultaneously at the two ends at intervals of three or four minutes, depending upon the steadiness of flow. If only one orifice was installed, the static pressure was taken as above, but only one set of differential readings could be obtained. Watches, adjusted to keep accurate time and checked against each other hourly where telephones were available, were used in recording the observations. Usually these observations were taken for periods of 7 or 8 hours daily for two days. In some cases, where a greater variety of flow conditions were obtainable, the test extended over a longer period. The temperature of the flowing gas and the barometric pressure were observed every three or four minutes; however, it so happened that they did not change to any great extent during any one test. The specific gravity of the gas, which was determined hourly, remained almost constant during each of the tests.

Samples of gas were collected from each of the pipe lines tested. A chemical analysis and a compressibility determination were made of each sample collected.

The length of a line or section of line tested was obtained from the survey data or maps made by the company owning the pipe line.

Procedure of Calculation

Figure 1 illustrates the method used in plotting the pressure observations taken during each of the seven or eight hour tests. The observed static and orifice differential pressures were plotted against time. These four pressure curves facilitate choosing intervals where the rate of flow is the same at both inlet and outlet. Such periods must be used in applying any flow formulas in order to eliminate the effect of any storing or emptying conditions, which would be present in the line if there was a marked change in the rate of flow at either end. In selecting an interval for calculating, care was also taken to choose one where the barometric pressure, flow temperature, and specific gravity of the gas were approximately constant.

After selecting a time interval by calculation, the next step was to arrive at some average values of the readings taken during this interval. The intervals have varied in length on different lines from 15 to 20 minutes with only three or four readings, to one to three hours with 45 or more readings. In order to obtain the best average value of each variable, it was necessary to calculate first an average value covering each time interval between successive readings. These values were then weighted by multiplying each average by the number of minutes in its respective time interval. The products obtained were added, and their sum was divided by the total number of minutes between the first and the last reading. The method of weighting individual readings is illustrated in Table 1. Actually, weighting was unnecessary in this case except to show the method, as all of the intervals between readings were equal, and the average value desired could have been obtained in the usual manner by dividing the sum of the average values for each time interval by the number of time intervals.

Before using these mean average values it was necessary to apply corrections for known errors in the test apparatus. The static pressure readings were recorded as indicated by the nominal values of the weights used on the dead-weight gauges. The averages of these approximate values were corrected to correspond with the carefully calibrated values of these weights.

In many of the tests, due to the location of the static-pressure taps of the orifice installation, the true inlet and outlet pressures were determined by add-

ing or subtracting the differential pressure in pounds per square inch across the orifice. If the static pressure tap was located upstream from the inlet orifice, the correction was subtracted; if downstream from the outlet orifice, the correction was added. This correction is illustrated in "Example of calculation."

Standards Used in Calculations

For the purpose of this report, 1 cubic foot of gas is defined as the amount which will occupy a volume of 1 cubic foot at a pressure of 14.4 pounds per square inch absolute and at a temperature of 60°F.

All gases were assumed to conform with Boyle's law at any pressures.

The standard absolute zero temperature used was 460°F. The average between the inlet and outlet temperatures of the gas flowing in each line was used as the flowing temperature when applying the various flow formulas.

Air coefficients used in the orifice measurement calculations were determined according to the methods recommended by the manufacturers of the meter in use on each line tested. Each air coefficient was corrected to the observed temperature and gravity of the gas that was recorded during the interval chosen for calculation.

The specific gravity of the gas was based on the specific gravity of air equal to unity.

The external diameter and the weight per foot of the pipe were obtained from the companies' records. The internal diameter of the pipe was obtained by subtracting the thickness of the walls, corresponding to the weight per foot of the pipe, from the external diameter.

Formulas and Symbols

The simplified formula for the flow of gas through orifices in orifice-meter measurement is:

$$Q_m = C_G \sqrt{hP}$$

Where Q_m = volume per hour under standard conditions, cubic feet,

C_G = hourly gas coefficient under observed conditions, cubic feet,

h = differential pressure across orifice plate, inches of water,

P = Absolute static pressure at orifice plate, pounds per square inch.

$$C_G = C_A \sqrt{\frac{T_O + t}{T_O + t_2}} \sqrt{\frac{1}{G}}$$

Where C_A = hourly air coefficient under standard conditions, cubic ft.,

T_O = 460°F.,

t_1 = 60°F.,

t_2 = observed flowing temperature, °F.,

G = specific gravity of gas, (air = 1).

Weymouth's formula[4] for the flow of gas through pipe is:

$$Q_c = 18.062 \frac{T_o + t_1}{P_o} \sqrt{\frac{(P_1^2 - P_2^2) d^{5\frac{1}{3}}}{GTL}}$$

Where P_1 = absolute inlet line pressure, pounds per square inch,

P_2 = absolute outlet line pressure, pounds per square inch,

d = internal diameter of line, inches,

T = absolute flowing temperature, °F., $(T_o + t_2)$

L = length of line, miles,

T_o = absolute temperature, 460° F., and

P_o = absolute pressure base, 14.4 pounds per square inch.

Comparison between measured volumes and volumes calculated from Weymouth's formula were made by expressing the difference between the two volumes as a percentage of the volume as calculated by Weymouth's formula. When the measured volume is less than that calculated by Weymouth's formula the percentage is negative, and when the measured volume is more than that calculated by Weymouth's formula the percentage is positive.

Example of Calculation

In Figure 1, the interval from 1:00 to 2:00 p.m. represents conditions of constant flow. From the test records for this interval it was found that from 1:12 to 1:56 p.m. there was a drop in the observed static pressure of 0.2 pound per square inch at both the inlet and the outlet. It is more desirable to calculate intervals where there is no change in the static pressures. However, over an interval of 44 minutes, a drop of 0.2 pound per square inch is very small. Only in a few tests have intervals been found where the pressures do not change at all.

Table 1 shows the method of determining an average value for a series of observed static pressure readings taken during the interval from 1:12 to 1:56 p.m. (Fig. 1). Observed readings of all variables have been averaged in like manner.

The mean weighted average values obtained by this method for the interval of 1:12 to 1:56 p.m. (Fig. 1) were:

	Mean weighted average values	
	Inlet	Outlet
p= Static pressure pounds per square inch gauge	= 136.88	123.50
h= Differential pressure, inches of water	= 22.70	25.16
t_2= Observed temperature of flowing gas, °F.	= 74.0	74.0
barometric pressure, inches of mercury	= 29.80	29.95
G= Specific gravity	= 0.597	0.597
Weight corrections, pounds per square inch	= +0.19	+0.17

4. Weymouth, T. R., Proc. Am. Soc. Mech. Eng., vol. 34, 1912, pp. 1091-1104.

From the above data the following values were determined:

Barometric pressure at the inlet=29.80×0.4912=14.54 pounds per square inch.

Barometric pressure at the outlet=29.95×0.4912=14.71 pounds per square inch.

Absolute static pressure at the inlet=13688+14.64+0.19=151.71 pounds per square inch.

Absolute static pressure at the outlet=123.50+14.71+0.17=138.38 pounds per square inch.

In determining absolute values for the true inlet pressure P_1 and the true outlet pressure P_2, the location of the pressure taps used for each test was considered. On this line the taps were located in the orifice flanges and the static pressures were taken downstream from the orifice. Therefore as explained earlier, the outlet differential pressure was added to the observed outlet static pressure to obtain the true outlet line pressure, as follows:

Outlet differential pressure = 25.16x0.0361 = 0.91 pounds per square inch.

P_2 = 138.38 + 0.91 = 139.29 pounds per square inch absolute.

P_1 = 151.71 pou ds per square inch absolute.

T = 534.0°F absolute flowing temperature.

Calculation of hourly orifice coefficient

The hourly orifice coefficient was calculated from the following data:

External diameter of pipe=18.000 inches

Internal diameter of pipe=17.500 inches.

Diameter of orifice at inlet, d=7.000 inches.

Diameter of orifice at outlet, d=7.000 inches.

Internal diameter of meter run at inlet, D=17.500 inches.

Internal diameter of meter run at outlet, D=17.500 inches.

$$C_A = KC_v d^2 \qquad (5)$$

Where C_A = hourly air coefficient at 14.4 pounds per square inch absolute, 60°F. base, flowing temperature 60°F., and specific gravity = 1,

K = 345.755 for flange taps,

C_v = 0.606000, where $\frac{d}{D} = \frac{7.000}{17.500} = 0.400$,

$d^2 = (7.00)^2 = 49$.

Then C_A = 345.755 x 0.606000 x 49 = 10,266.8 cubic feet of air per hour and

$$C_G = C_A \sqrt{\frac{460 + 60}{460 + 74}} \sqrt{\frac{1}{0.597}}$$

$$= 10{,}266.8 \times 0.9868 \times 1.2943,$$

$$= 13{,}112.9 \text{ cu. ft. of gas per hour.}$$

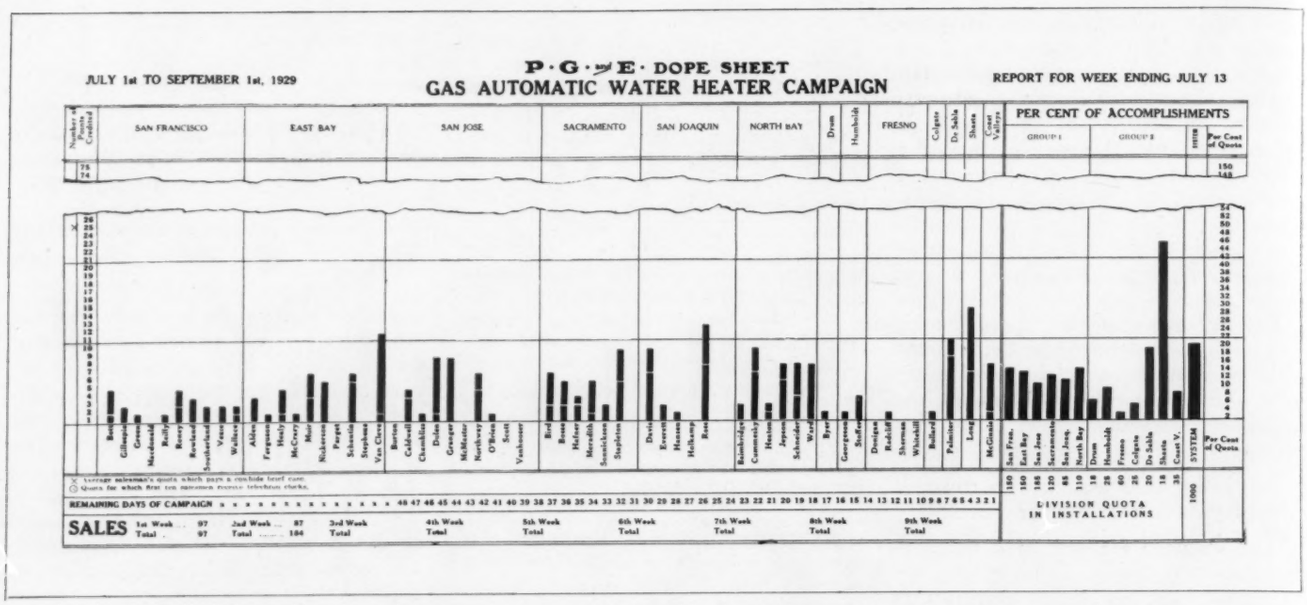
Calculation of Measured Volumes

The calculation of the measured volumes for the inlet and outlet meters was made as follows:

Since $Q_m = C_G \sqrt{hP}$

5. Metric Metal Works, Orifice Meters. Bull. 123, 1926, 37 pp

(Continued on Page 38)



The standing of individual salesmen, separate divisions, and of entire company system is shown on this "dope sheet" used in P. G. and E. water heater campaign

This Campaign Commands 100 Per Cent Support *from* Dealers, Employees, *and* Salesmen

SINCE the Pacific Gas and Electric Company entered into active merchandising of gas appliances a number of noteworthy campaigns have been conducted over its extensive northern California system. Two aspects of P. G. and E. selling stand out as unusual—the degree to which the utility cooperates with dealers and distributors in passing on to them the benefits of its campaign offers; and, the high measure of general employee cooperation which is thrown into the special selling efforts of the company.

In the present article is presented an outline of a current P. G. and E. campaign, on water heater sales. The varied publicity, employee "pep" program, and liberal sales, premium and prize provisions are typical of the methods which are enabling this company to add desirable load on its domestic lines.
—EDITOR.

THE Pacific Gas and Electric Company, in recognizing automatic gas water heating as a most desirable type of load builder, is giving automatic water heating sales increased attention in the pursuance of its 1929 sales plans.

A. C. Miller, domestic sales engineer for the company, calls particular attention to the means which have been chosen to make the "summer automatic water heater campaign" one which will develop interest on the part of every one interested in the sale of gas water heaters.

How much of it will you take?

Every time the P G and E has a special sale the employees make special money. If 1000 gas water heaters are sold, about 333 employees bonuses of $2.50 are paid. That seems to be "the law of averages" when employees cooperate.

BIG SALE NOW ON

The Automatic Gas Water Heater Campaign is on during July and August. 150,000 folders will be sent through the mails to our customers telling about our water heater special. Five big newspaper advertisements and five smaller ones will repeat this story that *now* is a *big opportunity* for P G and E customers to install modern hot water service in their homes. During this sale there is a special low payment of only

$5 DOWN

...and also very easy monthly payments. In addition, we are giving FREE a set of fine Cannon bath towels to our customers who select an Automatic Gas Water Heater during July and August.

PACIFIC GAS AND ELECTRIC COMPANY
P·G·and E·
Owned · Operated · Managed by Californians

General employees share in Pacific Gas and Electric Company special selling events. Copy reproduced above is from a broadside sent to employees in connection with the campaign described in these pages

The campaign plans of this company were made known to the leading distributors and the Gas Appliance Society —which in its membership represents gas appliance retailers all over northern California—two months before the selling period. This allows all interested to take advantage of the advertising and the assistance offered by the utility. In response, through the aid of the Gas Appliance Society, leading distributors and dealers are tying in with the selling offer proposed, and the movement has become general throughout northern California.

AVOIDING SUMMER SLUMP

The intensive selling effort is being directed over a two months' period, July and August, these months being considered an opportune time, first, by the increased necessity for hot water for bathing purposes, and, second, to keep the selling organization stimulated during the summer months.

Giving some of the details and set-up of the Pacific Gas and Electric Company campaign that proposes the direct sale and installation of 1000 automatic water heaters during the two-month period, there are a number of features in this campaign which may interest

other sales departments. An effort has been made to gain the cooperation of every member of the organization. There are awards offered in recognition of accomplishments for the various divisions and division sales managers. In the interests of obtaining the cooperation of every employee not in the sales department, $2.50 is being paid for each sales lead subsequently closed by a salesman. In addition to the regular bonus of $2.50, a $10.00 set of genuine Cannon towels is given the employee submitting five such prospects which are sold. Employees are being encouraged to purchase automatic water heaters for their own use. A special selling offer is being made on these sales on the basis of 25 per cent discount, 18 months terms and the campaign premium included.

A special broadside was prepared by J. Charles Jordan, manager of the P. G. and E. advertising department, encouraging the employees to take advantage of this offer. Ten thousand of these were mailed direct to the employees' homes. This broadside not only encouraged the employee to purchase for his own use, but gave him full details and instructions on the major points of interest in a general consumer offer.

The copy used in newspaper advertising was composed after a scientific analysis had been made from questionnaires sent out and answered by the salesmen on the firing line. Illustrations and suggestive features playing up the advantages of hot water to all members of the household were used. It is interesting to note that the advertising of the Pacific Gas and Electric Company feature hot water rather than any particular make of heater, it being left to the division to feature the sale of any particular make regularly listed in the price book. The predominating feature in this advertising copy is that it stresses the idea of the consumers inquiring from "their local dealers or the Pacific Gas and Electric Company."

In addition to newspaper advertising 150,000 pieces of direct-by-mail literature have been used, which feature a special inducement to buy during the campaign. A genuine set of nationally advertised Cannon towels is being given with the sale of each automatic water heater installed within these two months. This set consists of four face cloths, two bath towels, and a bath mat.

The manufacturers of Cannon towels in their national advertising have given recognition to the necessity of hot water in order to sell their product. The Pacific Gas and Electric Company has found that this premium has a tangible appeal to the consumer. And its special value for campaign use is that it provides a reason for the salesman to call back on a consumer who he knows is in need of an automatic water heater but who has delayed purchasing one. Easy monthly payments are offered as a sales inducement, with $5.00 down and the payments being allowed to extend over an 18-month period.

Weekly campaign bulletins are prepared in the company's general office and distributed throughout the division. These bulletins are gotten up in the form of thermometer charts which tell a complete story of the campaign's progress. A sufficient quantity of these bulletins are released so that they may be placed on all bulletin boards, in an effort to gain employee enthusiasm over the accomplishments of their division and the salesmen in their divisional sales organization. Other copies are sent to each key man in the company, to heads of departments and the entire sales crew. The "dope sheet," as it is called, is attached to the regular bulletin and gives the standing of each salesman in the organization week by week, and indicates the total number of points credited to each man. It also gives the percentage of quota attainment for each division. Another column gives the percentage of quota attainment for the entire system.

"Pep team" barnstorming a district office with a playlet which ridicules obsolete water heating methods

Instant hot water offers you–
4 to 6 hours more freedom each week
ISN'T it a wonderful convenience to always have plenty of hot water without bother or waiting?
Men like the hotels and clubs for that reason.
...And every woman can have excellent hot water service in her own home. With an automatic water heater, housework becomes easier and quicker—you save many precious minutes. Each week you can have 4 to 6 hours more time for motoring, shopping or outdoor sports.
No need of watching the automatic gas water heater
With the automatic water heater, a thermostat turns the gas on and off. It maintains the water temperature at 140 degrees day and night. At any moment one can have deep hot water for bathing, a basinful for shaving. No gas is wasted keeping the water hot; the water stays hot because the boiler is insulated.
This instant hot water service costs less than one-fifth of a cent per gallon—the lowest cost of any method for heating water in the home.
Special Offer by the P. G. and E.
For a brief term, you can have instant hot water service put into your own home for a very low first payment and the balance in easy monthly payments. The details on replacing your old water heater with a new automatic gas water heater can be obtained by telephoning or calling at our local office or at the local dealers.
PACIFIC GAS AND ELECTRIC COMPANY
P·G·and·E·
Owned·Operated·Managed
by Californians

Liberal use of advertising to support direct selling is observed in P. G. and E. drive on water heater load

Special window trims are being encouraged throughout the divisional offices. Water heater manufacturers are supplying exceptional display material.

In order to establish a fair basis of allotting quotas the various divisions have been divided into two groups, the first group consisting of divisions having three or more salesmen and the second group those having one to three salesmen. The campaign awards for accomplishment are as follows:

A divisional trophy for the division in either group having the outstanding sales accomplishment. At the end of the campaign H. M. Crawford, general sales manager, will present to the sales

(Continued on Page 58)

AT A RECENT department head meeting of Southern California Gas Company executives "Hotel and Restaurant Night" was observed, and the display of modern appliances shown at the left was exhibited. Left to right the items are: Automatic gas toasters; a heavy duty range; a deep fat fryer; a range and steamer combination unit—it does everything from vegetable steaming to pastry baking; next in line is the Humphrey Rotisserie, which displaces the old charcoal broiler; then an insulated bake oven; and a coffee urn equipped with Johnson thermostatic urn burner. All of these appliances, where the application demands it, are provided with the latest devices for automatic control.

This automatic gas toaster, installed in a large cafeteria on the Los Angeles system of the Southern California Gas Company, will run 720 slices per hour at a cost of about 2 cents—as compared to 26 cents for comparable electrical equipment. Toast business at this cafeteria increased 30 per cent in the first month after installing the gas unit.

Win *the* Commercial Cooking Load *with* Modern Appliances

By D. L. LEAHY

*Southern Counties Gas Company, Los Angeles, California**

D. L. Leahy

OUR company appreciates the value of the commercial cooking load. Its load factor and its volume are attractive. We also regard this industry as being progressive. Like our own it is endeavoring to give better service and is interested in increasing production and lowering operating costs. Therefore, there is an urge from the industry for a better application of fuel generally, and in some operations, the need is pressing. The point may be best illustrated by example:

The toast station has long been calling for increased production, convenience and flexibility in operation. That the craft has appreciated the efforts of the electrical appliance manufacturers to satisfy this urge is evidenced by the trend of the toaster load to electricity. This fuel is admittedly not productive of good toast, a quick humid heat being required, but quality is sacrificed to the above.

We propose to show progress in hotel and restaurant sales by returning this load to its proper place and through the same medium, the appliance. A progressive manufacturre has introduced a gas-fired toaster to meet all of the requirements of the toast station, including quality of product. It is thermostatically controlled. This toaster has been received enthusiastically by the trade and endorsements are voluntary.

In order to make a snap analysis of the situation, we will pass to another station, the fry cook. I refer particularly to deep fat frying. The urge here from the operator is for protection against burns, from the insurance companies for elimination of the fire hazards, from the public for tastier foods and from the owner for all of these plus the cold-blooded business angle of lower operating costs. Deep fat is expensive and if permitted to stand at a temperature lower than 100 degrees it becomes rancid. If held at a high temperature it burns the crumbs and particles from the previously cooked food, and renders the fat unfit for cooking due to the transferred scorched taste. The answer then is enclosed flame and controlled temperatures, and here the thermostat again plays an important part. We have such an appliance to meet this need.

One more example—the pastry chef. The urge for separately controlled heat in each of the decks of the pastry oven is a problem not unfamiliar to the men dealing directly with the baker in the kitchens of hotels, restaurants, schools and institutions. It was very necessary that we direct our attention to this station and supply an appliance to meet the need. A manufacturer is now successfully marketing just such an appliance—a well insulated oven, with separately controlled decks and the added

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* To this paper, presented by Mr. Leahy before the 1929 regional meeting of the Pacific Coast Gas Association Commercial Section, held at Los Angeles, there is added a resume of various important phases of the commercial cooking load which were touched upon in discussion following the paper. George H. Heckler, supervisor of the Southern California Gas Company's hotel and restaurant sales division, contributes this resume.—*Editor.*

Gas Appliance Drawings *Are* Sales Developers *for* Oklahoma Natural

By WILLIAM G. LOOMIS

Assistant General Commercial Manager, Oklahoma Natural Gas Corporation

DURING the latter part of 1928, the Oklahoma Natural Gas Corporation, believing that it would be able to render a more complete gas service to its customers, organized a Commercial Department under the direction of N. A. Newton. The sales policy adhered to has been one of quality, and not quantity. Only the best appliances available are displayed and sold by the corporation, and by this means it is expected that public relations will be greatly benefited.

In September, 1928, sales departments were opened in Tulsa, Oklahoma City and San Angelo, Texas. After the first of the year, Shawnee, Ardmore, and Enid began merchandising. In order to celebrate the opening at Enid, it was announced that a range would be given away free at the end of the opening campaign. Over two thousand people attended the drawing for the range, and the crowds filled the gas office and blocked the street in front of the entrance. The campaign was a great success, and in one month, more than a carload of ranges were sold at an average selling price of $110.00.

Tulsa and Oklahoma City are the main shipping points, and rush orders from the smaller towns are filled from one or the other of our large warehouses in these two cities. Appliances of the same manufacture are handled in each town, and due to the similarity of stock, this central warehousing plan is rendered practical.

A campaign has just been completed in Tulsa, Shawnee, and Enid, for the sale of washing machines equipped with a gas burner. Over 160 machines were sold. Since these machines retail at $175.00 each, an additional revenue of over $28,000 made the June sales a new record.

During June a water heater sale was also conducted, and resulted in an increase of 50 per cent over the first campaign. In the previous campaign we used the free trial plan, in which the heater is placed on trial at no obligation to the customer. In the June campaign, it was decided to give a water heater away free in each of the properties. Tickets were printed, each one bearing a different serial number, and on July 6th, a drawing was held in which the winner was awarded the water heater. Tickets were given only to the people permitting a heater to be installed in their home, one ticket being given for each dollar of the selling price. If a heater was sold outright without the trial offer, an additional 50 tickets were given. If the heater was on trial, and purchased within one week after installation, 25 extra tickets were given. This ticket plan seemed to work unusually well, and helped the salesmen in at least four ways.

(1) It helped to obtain trials, as it offered an attractive proposition and a strong inducement.

(2) It decreased the number of trial cancellations, because the tickets were given to the home owner before the heater was installed and tended to make him feel obligated.

(3) The extra tickets given for an outright sale helped to make sales which otherwise would have been trials. The extra tickets given for closing the sale within seven days also decreased the length of trials considerably.

(4) By giving one ticket for each dollar of value of the heater, a better grade heater was sold.

In the previous campaign, 95 per cent of the heaters put on trial were turned into sales, and it is thought that at least the same proportion of these trials will become actual sales this time.

Other towns of the Oklahoma Natural Gas Corporation will be opened for merchandising in the near future—the next two being Okmulgee, and Muskogee, the opening date having been set at August 15th.

LEFT: A gas range drawing is always good for a crowd. This one, staged by the Oklahoma Natural, is in progress at Tulsa, Oklahoma. RIGHT: An array of gas merchandise on the Oklahoma Natural Gas Corporation's sales floor at Tulsa.

PACIFIC COAST GAS ASSOCIATION

447 Sutter Street, San Francisco, California

A Department Conducted by Clifford Johnstone, Executive Secretary

Enthusiasm Brewing for Convention--Sept. 10-13

THERE are two prime requisites to success. The first is to have something which everybody needs and the second is enthusiasm of the contagious variety. The first the gas industry has in full measure, and the second also, but not to a sufficient degree. The men and women who make up the gas industry have every reason to be highly enthusiastic; the history of their industry, and the service it renders to humanity justify it. And not only that—our future requires it.

To make sure that everybody, from presidents to office-boys, is properly inoculated, September 10th has been set aside as the first of four "Enthusiasm Days." The treatment will be given to all who can come to Del Monte. The dose will be increased from day to day; the temperature will rise; the pressure will go higher, until with the last treatment at midnight or thereabouts on September 13th, we will all be "Enthusiasm Carriers" ready to go home and broadcast the idea that "Gas is Better."

A pre-convention treatment has been provided. Turn to another page in this magazine and read George Sadler's essay on "Why Gas is Better," in it is the enthusiasm of a splendid young gas man, and moreover, it is the truth and will do you good. Perhaps it will put you in the mood for more, which you certainly will get if you can come to Del Monte. "Gas is better" is also the theme for the the two Three-Minute Speaking Contests, one for men and one for women, elimination trials for which are now in progress the length of the Pacific Coast; and again for the "Stunts Night" program, in which gas companies will compete for the coveted Addison B. Day Trophy.

To get down to details about this High-Temperature Convention. The first session will be called to order by President Dickey on the afternoon of Tuesday, September 10th, and the final fall of the gavel will be at the banquet on the evening of Friday, September 13th. The Association's business will be transacted on Tuesday and Friday afternoons, accompanied by inspiring messages from leaders of the industry. At another general session on Wednesday morning our cooperative advertising campaign, then in progress, will be expounded and discussed, and in addition, we will listen to one of our own radio talks which will fill the Pacific Coast air lanes that morning. Wednesday afternoon, and Thursday and Friday mornings will be occupied by section meetings, in which those of similar interests can gather together and talk over their intimate problems in detail. Thursday afternoon the golfers can golf to their hearts content on the best of courses, and the rest of us will disport ourselves otherwise. This "Otherwise" is to be a delightful surprise.

Such scenes as this vista of Monterey Bay will meet those who attend Del Monte sessions

The two speaking contests will take place at luncheon on Wednesday and Thursday, the ladies coming first of course. We are again indebted to Jim Rawlins of Hill-Hubbell & Company for the splendid wrist watch which will be first prize in the men's contest. Not to be outdone, President Dickey will donate a wrist watch to the winning lady, reserving the right to personally afix it in its place. There will be second prizes of course. The Public Relations stunts will be on Thursday evening and there will be events for the ladies every afternoon and of course, dancing every evening.

The above is a rough and ready outline of events and says nothing of the work which has been done and is still being done to make each moment a profitable and pleasant one. All necessary details of hotel rates, reservation blanks, golf tournament entry cards and such will be mailed to all members about the middle of August, and a complete program will appear in the September issue of *Western Gas,* to be on your desk September 3rd. This issue will also contain the principal committee reports in full.

Sadler Wins First Essay Contest

THE first Essay Contest to be held by the Public Relations section of the Pacific Coast Gas Association has been completed, and the winning essay written by Geo. M. Sadler of the Accounting Department of the Los Angeles Gas and Electric Corporation appears on another page of this issue of *Western Gas*. Mr. Sadler has distinguished himself before, as he will be remembered as the winner of the Three-Minute Speaking Contest at the Coronado Convention last year.

Five hundred and seventy-six essays were submitted in the contest, and, as will be noted from Chairman F. E. Seaver's report published herewith, 338 of these were written by employees of the Los Angeles Gas and Electric Corporation. The employees of 29 gas companies were eligible for this contest, and the fact that nearly 60 per cent of all essays entered came from one organization, reflects great credit upon the management of that organization. The secretary was interested in learning the reason for such a splendid response and he believes the explanation will interest other Association members.

In the first place the company management believes that each employee is an integral and important unit of the organization and has for a number of years given every one who would take it an opportunity to become familiar with the policies of the company, and the details of its services to the public. This essay contest afforded one more such opportunity, as the management felt that the company and its service could not fail to be benefited if a large number of its employees would ponder on "Why Gas Is Better" long enough and intensely enough to write an essay on the subject. The contest was therefore extensively advertised throughout the organization, and D. L. Scott, Manager of Public Relations, asked each of a number of department heads to list for him all the reasons why gas *is* better. These reasons were assembled and mimeographed and made the subject for discussion at an employee's meeting, each person in attendance being supplied with a copy of the mimeographed list. Following this the contest was kept in the limelight through the company house organ and through numerous follow-up letters and progress reports. It is safe to say that the majority of the company's employees gave some thought to "Why Gas Is Better" and it is our belief that the employees and the company alike were benefited greatly thereby.

The contest was conducted for the Association by the Public Relations Section, of which A. E. Holloway of San Diego is chairman. F. E. Seaver of Los Angeles and Mrs. R. E. Creveling of San Diego, chairman of the Women's Committee, had charge of the details of the contest.

The detailed report is as follows:

PRIZE WINNERS

First Prize: Attendance at the Pacific Coast Gas Association Convention at Del Monte, at the expense of the company by which the winner is employed. Won by—

Standing		Grade (%)
1	George M. Sadler, Accounting Dept., Los Angeles Gas and Electric Corp.	91.8
	3 Cash prizes, to be paid by Pacific Coast Gas Assn.:	
2 ($50.00)	O. J. Kauffman, Accounting Dept., Los Angeles Gas and Elec. Corp.	88.2
3 ($30.00)	D. E. Farmer, Utilization Bureau, Portland Gas & Coke Co.	85.0
4 ($20.00)	Gerald E. Miller, Adjuster, Southern Counties Gas Co.	84.0
	10 Cash prizes, of $10 each, to be paid by the company by which the winner is employed:	
5	Ralph J. Phillips, Com'l Dept., San Diego Consolidated Gas & Elec. Co.	83.4
6	Frank W. Bullard, Colgate Division, Pacific Gas and Electric Co.	81.0
7	Tom Kerr, Auditor Central Office, Southern Counties Gas Co.	80.4
8	Wm. Wykes, Pressure Man, Seattle Lighting Co.	78.8
9*	Henry S. Harris, Gas Distribution Dept., Los Angeles Gas and Elec. Corp.	78.6
10*	Arthur W. Caldwell, San Jose Division, Pacific Gas and Elec. Co.	78.6
11*	Helen Moore, Order Clerk, Southern Counties Gas Co.	78.6
12	Albert Leech, Utilization Bureau, Portland Gas & Coke Co.	77.6
13	Lois E. Miller, Order Clerk, Los Angeles Gas and Elec. Co.	76.6
14	C. H. McCracken, Collector, Southern California Gas Co.	75.8

*Tied, same grade.

40 Cash Prizes of $5 each, awarded by lot, to be paid by the company by which the winner is employed:

Floris Case, Cashier, Northwest Cities Gas Company
V. W. Harper, Portland Gas & Coke Company
Ellamae Davis, Collection Dept., San Diego Consolidated Gas & Elec. Co.
Mrs. Pearl Bourks, Collection Dept., San Diego Consolidated Gas & Elec. Co.
F. J. Fitzgerald, Collector, Southern California Gas Co.
W. H. Schwalin, Salesman, Southern California Gas Co.
Bertha Richardson, Stenographer, Southern California Gas Co.
Alfred C. Delamare, Clerk, Southern California Gas Co.
Lucy A. Box, Engineering Dept., Gen'l Office, Pacific Gas and Elec. Co.
M. Luis Mont, Construction Dept., Salinas Office, Pacific Gas and Elec Co.
Fred A. Peck, Salesman, Salinas Office, Pacific Gas and Elec. Co.
O. B. Gaudie, Fresno Office, Pacific Gas and Elec. Co.
Peggy O'Mahony, Engineering Dept., Gen'l Office, Pacific Gas and Elec. Co.
C. W. Anderson, Sacramento Div., Pacific Gas and Elec. Co.
T. P. Trigg, Salesman, L. A. Gas and Elec. Corp.
E. C. Raggio, Investigation Clerk, L. A. Gas and Elec. Corp.
D. W. McMillan, Collection Dep't., L. A. Gas and Elec. Corp.
Wm. R. Raines, Pasadena Gas Shop, L. A. Gas and Elec. Corp.
W. F. Dyer, Electric Distribution, L. A. Gas and Elec. Corp.
Mrs. Joy Hampson, Collection Dep't., L. A. Gas and Elec. Corp.
Jess H. Slocum, Collection Dep't., L. A. Gas and Elec. Corp.
E. F. Beatie, Collection Dep't., L. A. Gas and Elec. Corp.
F. L. Washburn, Salesman, L. A. Gas and Elec. Corp.
Frank W. Duelks, Bookkeeping Dep't., L. A. Gas and Elec. Corp.
Franklin K. Murray, Collector, L. A. Gas and Elec. Corp.
F. P. Raymer, Eagle Rock Office, L. A. Gas and Elec. Corp.
W. G. McKee, Bookkeeper, L. A. Gas and Elec. Corp.
Etta Adel Schwarz, Secretary's Office, L. A. Gas and Elec. Corp.
A. T. Howard, Gas Distribution Dep't., L. A. Gas and Elec. Corp.
Robert L. Sullivan, Collection Dep't., L. A. Gas and Elec. Corp.
J. T. Moore, Branch Office Clerk, L. A. Gas and Elec. Corp.
R. B. Moore, Salesman, L. A. Gas and Elec. Corp.
Geo. L. Moxley, Collection Dep't., L. A. Gas and Elec. Corp.
E. R. Swaringen, Branch Office Clerk, L. A. Gas and Elec. Corp.
Donald Weiss, Salesman, L. A. Gas and Elec. Corp.
Arthur Maltitz, Treasurer's Office, L. A. Gas and Elec. Corp.
R. C. Monker, Bookkeeping Dep't., L. A. Gas and Elec. Corp.
C. E. Cook, Salesman, L. A. Gas and Elec. Corp.
J. L. Bourne, Seal Beach Station, L. A. Gas and Elec. Corp.
Elmer M. Knisely, Collector, L. A. Gas and Elec. Corp.

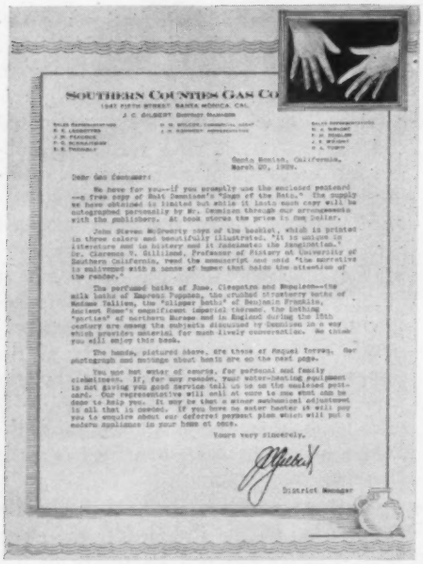
(For Participation in Essay Contest by Companies See Page 52.)

Nomination of Officers and Directors

IN COMPLIANCE with Article 3, Section 1, of the Association's By-laws, the Nominating Committee herewith announces the names of those members whom it will place in nomination at the annual election of officers to be held on September 10, 1929, at Del Monte, California.

For President—F. H. Bivens, Los Angeles, Calif.
For Vice-President, R. E. Fisher, San Francisco, Calif.
For Treasurer—D. G. Martin, San Francisco, Calif.
For Directors (2-year term):
Geo. A. Campbell, Reno, Nevada.
John P. Coghlan, San Francisco, Calif.
M. A. Pooler, Tucson, Ariz.
W. F. Raber, San Diego, Calif.
(Signed) Nominating Committee:
C. O. G. Miller, Chairman
C. Y. Bowers
George Hammer
E. S. Hoyt, Jr.
L. K. Klauber

The submission of names by the Nominating Committee shall not debar any member from making nominations for any or all of the separate offices, which nomination, if seconded, shall be submitted for balloting at the same time and in the same manner as those of the Nominating Committee.



SOUTHERN COUNTIES GAS CO

Santa Monica, California,
March 20, 1929.

Dear Gas Customer:

We have for you--if you promptly use the enclosed postcard--a free copy of Walt Dennison's "Saga of the Bath." The supply we have obtained is limited but while it lasts each copy will be autographed personally by Mr. Dennison through our arrangements with the publishers. At book stores the price is One Dollar.

John Steven McGroarty says of the booklet, which is printed in three colors and beautifully illustrated, "It is unique in literature and in history and it fascinates the imagination." Dr. Clarence V. Gilliland, Professor of History at University of Southern California, read the manuscript and said "the narrative is enlivened with a sense of humor that holds the attention of the reader."

The perfumed baths of Rome, Cleopatra and Napoleon--the milk baths of Empress Poppaea, the crushed strawberry baths of Madame Talien, the "slipper baths" of Benjamin Franklin, Ancient Rome's magnificent imperial thermae, the bathing "parties" of northern Europe and in England during the 17th century are among the subjects discussed by Dennison in a way which provides material for much lively conversation. We think you will enjoy this book.

The books, pictured above, are those of Raquel Torres. Our photograph and writeup about her is on the next page.

You use hot water of course, for personal and family cleanliness. If, for any reason, your water-heating equipment is not giving you good service tell us so on the enclosed postcard. Our representative will call at once to see what can be done to help you. It may be that a minor mechanical adjustment is all that is needed. If you have no water heater it will pay you to enquire about our deferred payment plan which will put a modern appliance in your home at once.

Yours very sincerely,

District Manager

This letter was Page 1 of a four-page folder issued by Southern Counties Gas Company in laying direct-by-mail foundation for water heater sales. Note references to gift booklet, and also to offer of service calls.

A Gas Company Analyzes Direct-Mail Technique

By WALTER D. THURBER

Manager of Advertising and Publicity Department
Southern Counties Gas Company
Los Angeles, California

TO what extent is sales resistance broken down by a gift offer? What is the relative value of a sales message mailed under first class postage as compared with circulars mailed under the cheaper rate?

Do consumers respond to a sincerely voiced letter from the gas company manager inquiring as to their service needs on the appliances now in use?

Answers to these questions were looked for in the analysis of three direct-to-consumer advertising campaigns conducted by Southern Counties Gas Company during the past few months. While each of the three campaigns was supported by newspaper advertising and by attractive window and sales-floor displays the material sent by mail was "keyed" to permit reasonably fair conclusions as to its value.

It appears that the small additional postage required to send advertising by first class mail is more than off-set by the returns. A circular sent by mail, not enclosed in an envelope, is obviously a circular and the seal often remains unbroken in the waste basket in the home of the consumer. A sealed letter demands attention. In our direct-mail-to-consumer experiment on ranges and water heaters the material was mailed under first class postage. The mailing piece consisted of a four-page folder, the first page of which carried a letter from the district manager offering expert adjustments of appliances that were not giving satisfactory service and mentioning the gift which would be sent upon request. This gift, for the range prospects, was a booklet, "Getting the Best That Gas Can Give You." The letter on water heaters offered a free copy of "Saga of the Bath," (described later) autographed by the author.

In a similar experiment on refrigerators, circulars in color provided by the appliance manufacturer were mailed without being enclosed in envelopes.

The comparative returns shown in Table 1, compiled at the end of 30 days, tell an interesting story in the light of what has just been said.

With these figures before us we began to bore more deeply into cause and effect. Why were the returns from the water-heater campaign—b o t h in the number of inquiries received and in sales reported—so much greater than in either of the others?

Reports from the sales organization were studied. In fact, since the primary object of our advertising is to increase both the gas load and the sale of appliances merchandised by our company, we must base our conclusions on the cold figures handed in by the accountants who make up the sales reports.

Perhaps it should be made clear that no one in our company, least of all the sales or advertising departments, evaluates merchandise advertising on the basis of sales made within so short a period as one month or even two or three months. We know that the value of sales and advertising effort is cumulative. We are making sales now as the result of advertising or personal canvasses of a year ago. Twelve months from now, or longer, sales will be made which might be traced to the advertising or sales solicitation of today.

As we review the history of the recent campaign on water heaters these points develop:

The Mailing Piece: This four-page folder carried on page one of the previously mentioned letter signed by the district manager. The text of this letter is reproduced with this article. Pages two and three of the letter were devoted to pictures and type illustrating the health, the comfort and the convenience resulting from an adequate supply of hot water in the home. Page four presented an illustration and description of a modern automatic gas water heater, with appropriate sales copy.

The Gift: The gift booklet, written by Walt Dennison,* was printed in three colors with an attractive deckle edged cover. Its text sought to set forth briefly a history of bathing "around the world and through the centuries." Baths of famous characters in history were mentioned. Authorities for much of the information it contained were cited in a bibliography. Comments from a noted historian and a noted playright and author were quoted on the title page. The name of the company was not mentioned in the book and the word "gas" was used only once. The demand of the human race for hot water in all lands over a period of many centuries was, however, revealed in practically all of the historical sketches.

Technique in Delivering the Gift: Three methods of delivering the gift booklet, "Saga of the Bath," to the more than 2,000 consumers who asked for it, were tried out. From those who received their book by mail came an occasional note of appreciation for the gift. Booklets delivered by a salesman but handed to the consumer enclosed in

(Continued on Page 66)

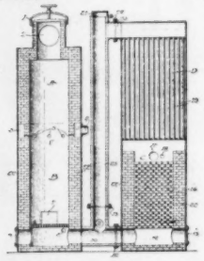
**Western Gas* has a well grounded suspicion that "Walt Dennison" is none other than Walter Thurber, author of the present article, in real life.—*Editor.*

TABLE 1

Pieces Mailed	Subject of Letter	Inquiries Received	Percentage of Inquiries
90,000	Ranges	2,492	2.77
48,000	Water Heaters	2,080	4.26
26,000	Refrigeration	230	.87

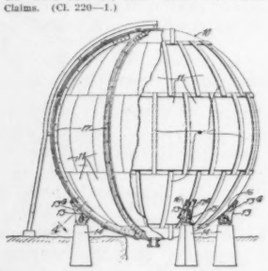
THIS MONTH'S PATENTS PERTAINING TO THE INDUSTRY

1,716,676. PROCESS OF MAKING MIXED WATER GAS AND OIL GAS. WILLIAM D. WILCOX, Idaho Falls, Idaho. Filed Dec. 31, 1924. Serial No. 759,167. 2 Claims (Cl. 48—200.)



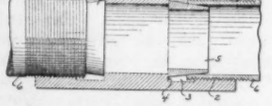
1. The process of making mixed water gas and oil gas in a gas generator having a fuel bed which comprises; blasting the fuel with air admitted at an upper level of the generator, causing the blast gases to pass downwardly and into a regenerator, heating the regenerator by burning the blast gases therein, passing steam into the base of the generator and upwardly through the fuel bed of the generator for an interval to generate water gas and thereby reduce the temperature of the blasted fuel, withdrawing the resultant water gas from the upper part of the generator, then admitting steam and oil to the upper part of the regenerator, vaporizing the oil and steam mixture by passing it downwardly through the regenerator and then passing the heated oil and steam mixture through the heated fuel in the generator, and thereby forming mixed water gas and oil gas; and withdrawing the mixed water gas and oil gas from the upper part of the generator.

1,688,868. GAS HOLDER. GEORGE T. HORTON, Chicago, Ill. Filed June 11, 1927. Serial No. 198,245. 2 Claims. (Cl. 220—1.)



1. A gas holder comprising a substantially spherical shell substantially supported by supporting legs resting on foundations and attached at their upper ends to the shell on the line of a circle lying in a horizontal plane and having a diameter substantially less than the diameter of a great circle of said shell, and vertically arranged curved stiffening members attached to the inner wall of said shell extending from substantially the top of the shell to substantially the bottom of the same, one of said stiffening members being arranged adjacent each supporting leg.

1,682,635. PIPE COUPLING. CHARLES E. SMITH, Three Rivers, Tex. Filed Mar. 25, 1927. Serial No. 178,385. 3 Claims. (Cl. 285—157.)

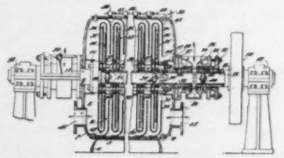


1. A pipe coupler having its bore threaded from the ends thereof and having annular pockets at the terminals of the threads, and hollow frusto conical expanders formed independent of the coupling and designed to be arranged therein and have their widened ends contact with the inner walls of the pockets and to project into the threaded portion of the bore of the coupler and engage with pipes which are screwed in the coupler.

1,690,352. HEAT-RESISTING ALLOY. HARRY M. WILLIAMS, Dayton, Ohio. Filed June 11, 1927. Serial No. 198,502. 2 Claims. (Cl. 75—1.)

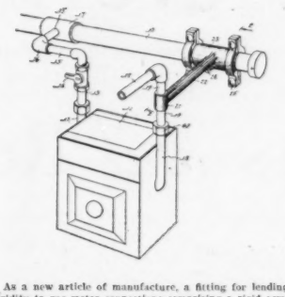
1. A heat resistant alloy composed of iron, 2.50 to 3.00% carbon, 3.00 to 3.50% silicon and 1.90 to 2.25% phosphorus.

1,689,189. ROTARY HEAT EXCHANGER. FRANK S. BROADHURST, Watertown, Mass. Filed Mar. 30, 1925. Serial No. 19,249. 11 Claims. (Cl. 257—79.)



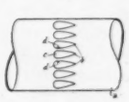
3. A heat exchanger, having, in combination, a shell, a series of partitions each having a central opening secured to the internal peripheral surface of the shell, a hollow disk having non-central openings mounted between adjacent partitions, hubs for each disk having openings communicating with the openings in the disk, said internal peripheral surface, partitions, openings therein, and the exterior surface of the disks forming a tortuous conduit for a fluid, the interior of the disks, openings therein and in the hubs forming a tortuous conduit for another fluid, and means for simultaneously rotating the series of hubs and disks.

1,722,236. GAS METER FITTING. ADOLPH SCHONEBERGER, New York, N. Y., assignor to Albert Benfield, New York, N. Y. Filed Aug. 18, 1927. Serial No. 213,843. 1 Claim. (Cl. 285—203.)



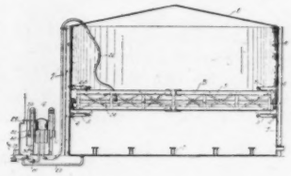
As a new article of manufacture, a fitting for lending rigidity to gas meter connections comprising a rigid arm, an internally threaded right angularly disposed sleeve at one end of the arm into which a riser from the meter is adapted to be screwed, and a right angularly disposed sleeve at the other end of the arm adapted to grip a service pipe.

1,702,274. DETERMINING THE QUANTITY OF FLOWING LIQUIDS OR GASES. ERNST SCHMIDT, Danzig-Langfuhr, Free City of Danzig. Filed Apr. 14, 1927, Serial No. 183,830, and in Germany Mar. 30, 1926. 2 Claims. (Cl. 137—75.)



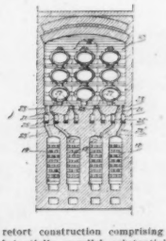
1. In a device of the kind described a hollow cylindrical body, a plurality of parallel, spacedly disposed substantially pear-shaped bodies, constituting concentric rings and with their pointed ends in the longitudinal direction of the cylindrical body and means at the obtuse ends of certain of said bodies and near the constricted points of the intervening passages for measuring and transmitting the pressure of the fluids or liquids flowing through the cylindrical body.

1,683,065. GAS HOLDER. JOHN H. WIGGINS, Bartlesville, Okla. Filed July 20, 1925. Serial No. 44,855. 4 Claims. (Cl. 48—176.)



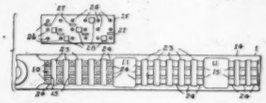
1. A gas holder, comprising a cylindrical side wall, a vertically-movable deck or piston having its peripheral portion spaced away from said side wall, a radially-movable flexible sealing apparatus at the periphery of the deck that acts on the side wall of the holder, a supporting means for said sealing apparatus, a gas-tight, flexible closure for the space between said sealing apparatus and deck, and means for recovering any gas that escapes upwardly through the joint between said sealing apparatus and side wall.

1,716,643. GAS RETORT. HEINRICH KOPPERS, Essen-Ruhr, Germany, assignor to The Koppers Development Corporation, Pittsburgh, Pa., a Corporation of Pennsylvania. Filed July 7, 1921. Serial No. 483,049, and in Germany Sept. 1, 1919. 5 Claims. (Cl. 202—145.) (Granted under the provisions of the act of Mar. 3, 1921, 41 Stat. L., 1313.)



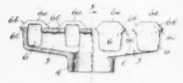
1. A gas retort construction comprising a horizontal series of substantially parallel substantially horizontal retorts, a group of vertical flues along each of the two opposite lateral sides of each of said retorts, a group of flues over each of said retorts communicating with the flues on both lateral sides thereof respectively, a substantially horizontal bus channel below each of the groups of vertical flues communicating with said vertical flues thereabove at the lower parts thereof, a regenerator below each of the bus channels communicating with the bus channel thereabove by a plurality of separate ducts spaced from each other along the bus channel with which said ducts communicate.

1,716,601. METHOD OF MAKING GAS BURNERS. GEORGE FOSTER REENOR, Mercer, Pa. Filed Feb. 2, 1927. Serial No. 165,311. 6 Claims. (Cl. 29—157.)



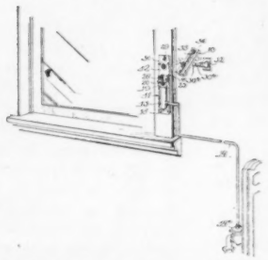
1. The method of making a gas burner which consists in casting a one-piece hollow blank, machining in one face thereof intersecting grooves so as to leave thereon a plurality of rows of tips of uniform size on each side of the grooves, and then drilling uniformly-sized ports centrally and longitudinally through the tips into the hollow of the blank.

1,677,289. GAS BURNER FOR STOVES. WALTER OLSEN and SOPHUS RASMUSSEN, Albert Lea, Minn., assignors to American Gas Machine Company, Albert Lea, Minn., a Corporation of Minnesota. Filed Aug. 3, 1925. Serial No. 47,797. 4 Claims. (Cl. 158—104.)



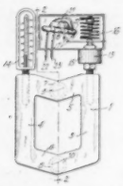
1. A gas burner comprising a plurality of spaced elongated adjacent hollow sections, said sections each having a series of spaced slots extending thereacross, the tops of said sections comprising horizontal flat top portions and side portions inclined downwardly therefrom, the lower edge of said inclined portions terminating substantially at the bottom of said slots, said sections having means below said inclined portions for directing the air away from said inclined portions and slots.

1,682,905. THERMOSTAT CONTROL FOR RADIATOR VALVES. EARL VERNON HILL, Chicago, Ill. Filed Sept. 21, 1925. Serial No. 57,561. 5 Claims. (Cl. 236—68.)



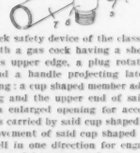
1. In combination with a thermostatic member and a shut-off device to be controlled thereby, a motor member remote from said shut-off device comprising a vessel containing a liquid of low boiling point, a pipe connecting said vessel to said shut-off device for operating the same by the pressure developed in said vessel, a thermal element associated with said vessel, conductors for supplying electric current to said thermal element, one of said conductors including the thermostatic member, a normally closed make-and-break switch interposed in the other conductor, and means by which said switch is adapted to be opened upon the development of a predetermined pressure in said vessel.

1,695,309. AUTOMATIC TEMPERATURE REGULATOR. JOHN H. P. WOOD, Albany, N. Y. Filed Nov. 19, 1927. Serial No. 234,441. 5 Claims. (Cl. 236—32.)



2. A thermostat support comprising a hollow, metal ring having openings in oppositely disposed portions thereof providing an entrance and an exit for water circulated through said ring, and having spaced openings adjacent said water entrance adapted to receive a thermostat and a calibrating thermometer therefor.

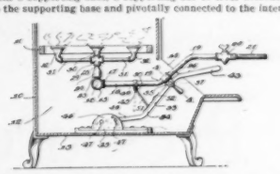
1,692,188. GAS-COCK SAFETY DEVICE. CYRIEL ROOSE, St. Clair Shores, and JAMES BENZIE, Detroit, Mich. Filed June 29, 1927. Serial No. 200,060. 2 Claims. (Cl. 251—109.)



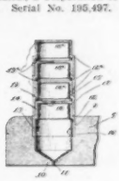
1. A gas cock safety device of the class described adapted for use with a gas cock having a shell provided with a recess in its upper edge, a plug rotatably mounted in said shell, and a handle projecting laterally from said plug, comprising: a cup shaped member adapted for seating over said plug and the upper end of said shell and provided with an enlarged opening for accommodating said handle; means carried by said cup shaped member adapted upon axial movement of said cup shaped member relatively to said shell in one direction for engaging in said recess, and upon axial movement in the opposite direction for disengaging from said recess, said plug being non-rotatable relatively to said shell upon engagement of said means in said recess; and means for adjusting the circumferential position of said engagement means relatively to said cup shaped member.

1,722,225. GAS BURNER FOR STARTING COAL FIRES. MICHAEL JUPIN, New Bedford, Mass. Filed Jan. 14, 1928. Serial No. 246,796. 7 Claims. (Cl. 158—10.)

1. A portable gas burner for use in starting the burning of fuel in stoves, comprising a gas pipe having a series of burners rising therefrom in spaced parallel relation to each other, and a feed pipe connected to said gas pipe; together with a supporting base, a supporting bar or lever attached to the supporting base and pivotally connected to the intermediate portion of the feed pipe for swinging movement of the gas burner to and form the said supporting base, and means for supporting the gas burner in adjusted position with respect to the supporting bar and base.

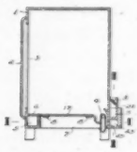


1,699,297. DEVICE FOR CONTROLLING FUEL SUPPLY TO GAS-BURNER PILOTS. ELMER B. LEDSETTER, Detroit, Mich., assignor to Everhot Heater Company, Detroit, Mich., a Corporation of Michigan. Filed May 31, 1927. Serial No. 195,497. 9 Claims. (Cl. 158—115.)



1. A device for regulating the gas supply to a pilot light, comprising means forming a series of chambers interconnected by non-aligned orifices of circular cross section.

1,716,534. GAS OVEN. FREDERICK SAMUEL SCOTT, Christchurch, New Zealand. Filed Feb. 16, 1928. Serial No. 254,726, and in New Zealand Mar. 1, 1927. 3 Claims. (Cl. 126—39.)

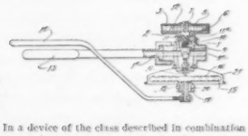


1. In a gas oven having a door opening at the front and a gas burner disposed in the rear lower corner of such oven, outlet openings for waste gases arranged immediately to the inner side of the front of the oven at a level beneath said door opening, and substantially horizontal passages at the bottom of the oven communicating with said outlet openings and with a vent pipe at the rear of the oven.

1,716,535. GAS-SHUT-OFF VALVE PULL BOX. HENRY SIEMEN, New York, N. Y. Filed Jan. 24, 1927. Serial No. 163,293. 8 Claims. (Cl. 137—111.)

2. A device of the character described, comprising a base, a shallow annular flange on the front face thereof, hooks projecting inwardly from said flange at one end thereof, oppositely disposed depressions in said flange near the other end thereof, a cover adapted to fit over said flange, cams on the inner face of said cover adapted to interlock with said flange hooks, projections on the inner face of said cover adapted to register with said flange depressions, and a lock on said cover for securing the same to said base.

1,692,421. VALVE FOR REGULATING GAS FLAMES. GEORGE SCHLESSELBURG, Chicago, Ill., assignor to Francis Edward Hale, London, England. Filed June 8, 1926, Serial No. 114,421, and in Great Britain June 8, 1925. Renewed Aug. 17, 1928. 9 Claims. (Cl. 67—116.)



1. In a device of the class described in combination with a burner and gas passage, a main plug for regulating the flow of gas through the gas passage, a supplemental plug provided with a cross bore and rotatably mounted and normally seated within the main plug and extending across the gas passage for regulating the flow of gas for lighting purposes, means associated with both main and supplemental plugs for imparting rotation to the supplemental plug by a limited degree of movement and rotation to the main plug by continued movement, and thermostatic means associated with the burner when the flame is maintained for lifting the supplemental plug from its seat in the main plug to maintain the flow of gas, and means operable to effect reseating of the supplemental plug when the gas is extinguished, and means for regulating the extent of the lifting movement imparted to the supplemental plug by the thermostatic means, substantially as described.

With *the* Metermen

Pressure Regulators *and* Regulation

By F. I. THOMPSON

*Westcott and Greis, Inc., Tulsa, Oklahoma**

MUCH time, money and effort is spent in the manufacture of meters and the reconditioning of these meters in repair shops after they have been in service for five years or less, to bring them within very close limits of accuracy. Yet all of this investment may be wasted if pressure control is poor.

CAUSES OF POOR REGULATION

In the large majority of cases in which we are called upon to determine the reason for poor regulation, we find that the trouble is equally due to the valves being too large for the demand upon them, dirt, and the improper application of various types of construction. Most regulators are made so that it is possible to change the diaphragm sizes in order to vary the outlet pressure which they govern. When these changes are made with regard to the valve body and the design of the valve, this is an advantage. Frequently, when these points are not considered, it results in unsatisfactory and erratic pressure control, if not in broken regulators. It is well to consider the amount of weight which the standards and the diaphragm covers have to support. For example, a six-inch regulator with the following sizes of diaphragms has to be made to carry a heavy load. A 24-inch diaphragm at four ounces per square inch gauge pressure carries a total deadweight of 121 pounds in round numbers; at eight ounces, 243 pounds; at one pound, 485; while a 14-inch diaphragm under five pounds pressure carries 770 pounds; and at eight pounds pressure, 1231 pounds; and a five-inch diaphragm at 50 pounds pressure supports 982 pounds. In all cases, this relatively small pressure per square inch necessitates the standards and diaphragm covers being of considerable strength. It is, therefore, not surprising that these parts sometimes break when the pressure is applied to them suddenly.

What is a regulator, and how does it work? It is essentially a weight scale. The pressure to be carried is applied to the diaphragm, which must overcome the weight on the lever arm, or have the weight overcome it, or be a perfect balance. At the point of this balance is the pressure which it is desired to carry and there is no power to operate the valves. In low pressure distribution work it is desired to have changes in pressure of a quarter of an ounce or less per square inch produce a movement in the valves of the regulator. On a 20-inch diaphragm which is usually used on the four-inch regulators for standard low pressure service, a change in pressure of this amount produces an unbalanced effect on the diaphragm of approximately five pounds. It is apparent that it would take no excessive amount of dirt, or binding of parts to prevent this small amount of power from operating the valve. While this differential in balance will readily operate the proper design of regulator in good mechanical condition at low pressures, it would be unreasonable to suppose that it would operate the same regulator at considerably higher pressure.

*Given before the Annual Gas Meter Short Course, at Norman, Oklahoma.

WEIGHT SCALE COMPARISON

Keeping in mind the scales, we might make this comparison: a balance delicate enough to accurately measure a fraction of an ounce would not necessarily be affected by the addition of that same fraction if both sides were loaded with 20 pounds. Therefore, the diaphragm, the construction of the diaphragm chamber and supports and the amount of slack left in the diaphragm are of great importance but, in themselves, they cannot control the action of the regulator unless the valve body and the valve design are considered with them.

It is important that the valve ports have sufficient area to cause the valve to make a minimum amount of lift to deliver the maximum capacity obtainable through the ports at various pressure drops across them.

A regulator has no capacity except when its valves are wide open. The volume which will pass varies as the square root of the differential drop in pressure across the ports. For all other positions of the valves, the quantity passed is roughly proportional to the lift of the valve. That is, if the valves are half-open, it would pass approximately one-half of its maximum capacity. If a valve has to make too great a rise to deliver its full volume it will cause an actual change in the effective area of the diaphragm upon which the pressure must act before the valve will move. The case in mind was the conversion of a high pressure regulator by changing the head so as to deliver intermediate pressures, where the difference in inlet and outlet pressure was less than 10 pounds.

A manufacturer frequently installs in high pressure regulators, long stroke valves having v-shaped port openings or an extra lip under the top valve, to prevent wire-drawing. The reason for this is that so many regulators are installed of the same size as the line in which they are set. It results in two things which are not necessarily advantageous to perfect regulation because of the fact that the stroke or the lift of the valve is increased and the valve unbalanced. In the case of the first method it also follows that the capacity is cut down. If balanced valves were installed on these regulators the resulting short lift at periods of low demand

Association Begins Third Year

MEMBERS of the Southern California Meter Association met at the Breakers Hotel, Long Beach, Calif., on Thursday, July 25, and inaugurated the third year of that organization's life. B. M. Laulhere, opening the business session, expressed his appreciation of the support accorded him as president in the year concluded, and then turned the gavel over to J J. Delaney, president-elect. New officers and committee chairmen, announced in last month's *Western Gas*, were introduced to the membership, following which reports were offered by chairmen, and announcement made regarding the publication of the Association's 1928-1829 Proceedings, which will shortly be under way.

Under the head of program for the July meeting a new feature was introduced, in an open forum discussion on practical field problems. T. K. M. Smith, first president of the Association and now chairman of the standards committee, led a discussion on the piping of gauges, which occupied a large part of the program and was participated in by a dozen or more of the members who contributed their experiences on gauge piping. Among the phases of the problem touched upon were:

The most practical location for the by-pass around the gauge.

Size of gauge lines.

Practicability of welded gauge lines.

Copper tubing and compression couplings.

Maximum length of gauge lines.

This open forum feature met with much favor and will probably make up a part of each program hereafter. A complete schedule of papers for the year ahead also is now being worked out by the Association directorate under the leadership of Ralph Cook, program committee chairman.

An interesting item on the July 25 program was the discussion by H. S. Bean, associate physicist of the United States Bureau of Standards, who described measurement tests which he is now directing for the Bureau at the Aliso Street plant of the Los Angeles Gas and Electric Corporation, Los Angeles. His remarks are reviewed elsewhere in this department.

would produce wire-drawing, ruining the seats and valves in a very short time.

The fact that it may be necessary to lay a six-inch line to carry sufficient gas for the ultimate demand or to overcome the friction loss due to the length of the line, does not necessarily mean that a six-inch regulator should be placed in this pipe. With a materially higher inlet pressure, a three-inch or four-inch valve would pass as much or more gas than the six-inch line on the outlet could handle on account of the reduction in pressure. Therefore, when regulators are installed on their capacity there is a great saving, not only in the initial investment but also in the benefit gained by greatly improved control of pressure. With the proper size of regulator for the load balanced valves can be used, for they are not in danger of being damaged.

The use of pilot valve or auxiliary operated regulators has become quite general for the reason that they permit the use of greater pressure on the diaphragm controlling the valves than the outlet pressure which is to be carried. This results in improved regulation because the power is there to overcome any of the conditions referred to above.

There is a well-known low pressure regulator with perfectly balanced valves which makes use of two diaghragms and a multiplication of the power from these diaphragms, by a system of linkage to the lower arm. The power is increased approximately four and one-half times over a single diaphragm with a single weighting.

It can readily be seen that the accumulation of deposits upon the valves and valve seats can unbalance a perfectly balanced valve. An increase in power is necessary to operate the regulator when it occurs. This power can come from only one source, when the usual single diaphragm regulator is used, and that is by the increased changes in the outlet pressure.

Usually in the pressure piping to the diaphragm case there is placed a stricture. If this small opening becomes clogged with dirt the regulator is practically inoperative. It frequently happens during periods of maximum demand that the flow across the opening of the diaphragm pressure piping causes a false pressure on the diaphragm. The control of the pressure then becomes erratic. In this case, the diaphragm piping should be taken from the main line and connected to the dead end of the by-pass on the outlet side, or else extend to the center of the pipe and the opening turned down-stream.

CARE IN ASSEMBLY

Most of the manufacturers of regulators punch-mark the parts so that in assembling they will maintain the same relation in which the drilling for pins was made. In tearing down a regulator for cleaning and repairing, care should be take that these markings are still visible, and in case they have been obliterated by wear they should be marked so that in re-assembling they will take the same alignment as they had. This is probably more important in regulators which have been used than it is in their original assembly, because a certain amount of wear has taken place.

(Continued on Page 56)

New Tests Proceeding *at* L. A. G. *and* E. Plant

OUT of the gas measurement work initiated by the Measurement Committee of the Natural Gas Association, some four years ago, and carried on through the cooperation of the Bureau of Standards and Bureau of Mines with the Measurements Committee since that time, there has grown a significant program of research.

H. S. Bean, associate physicist of the Bureau of Standards, is now directing a series of tests measuring large volumes of gas in the various orifice ratios, as one phase of this measurement program. These tests are being made at the Aliso and Macy Streets plant of the Los Angeles Gas and Electric Corporation.

A test set-up of a 16-inch line has been made at the L.A.G. and E. plant. This will first be checked against three 10-inch set-ups with orifices in various sizes up to a maximum of .6 of the pipe diameter. Various sizes of discs will be used in the 16-inch line up to a maximum flow of 2,000,000 cu. ft. of gas per hour. Static pressures will vary from 15 to 25 lbs. A sufficient number of 10-inch set-ups will be used in checking the 16-inch set-up from flows of 100,000 feet up to 2,000,000 feet per hour, to keep the differential on the 10-inch set-ups within the normal operating limits of 50 inches water pressure.

The differential on the 16-inch set-up will vary from a few inches of water pressure to in the neighborhood of 100 inches of water differential. In order to measure this high differential, mercury will be used in place of water in the manometer.

Several different sizes of discs will be used in the 16-inch set-up.

Computations on these tests will be kept up from day to day along with the recording of the actual test data. Test and computation operations will require the time of from six to 11 men continuously. The work will be completed in from six to eight weeks.

If time permits, 8-inch and 4-inch set-ups will be substituted for the present 16-inch set-up, and will be tested in a similar manner against the 10-jnch set-ups.

J. J. DELANEY TO GO WITH WESTCOTT & GREIS

J. J. Delaney, formerly superintendent of measurement for the General Petroleum Corporation, and president-elect of the Southern California Meter Association, is leaving California on August 15 for Texas, where he will take up new duties as assistant to Mr. Wahl, district manager of Westcott & Greis. Mr. Delaney will probably be located either at Dallas or at Houston. He is tendering his resignation as president of the S. C. M. A.

WASHINGTON GAS & ELEC. CO. GETS MONTESANO FRANCHISE

The city council of Montesano, Washington, early in July granted a franchise to the Washington Gas and Electric Company for the distribution of artificial or natural gas in that city. A pipeline will be extended from Aberdeen, Washington to serve the town. The company has also applied for the privilege of serving Pinehurst, in the same

WISCONSIN UTILITIES ASS'N. MOVES OFFICES

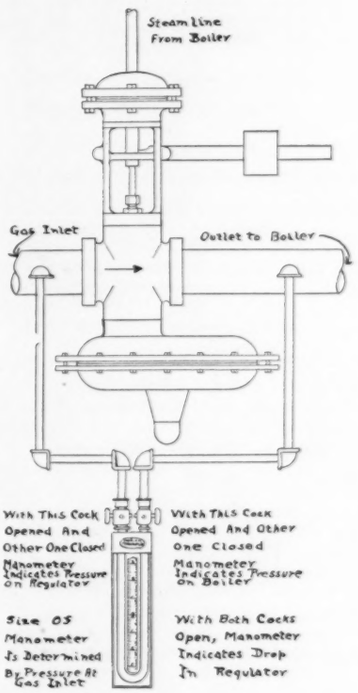
Wisconsin Utilities Association announces the removal of its offices to 105 Wells Street, Milwaukee, Wisconsin, according to a communication received from John N. Cadby, executive-secretary of the Association.

NEW MANOMETER IS COMBINED FLOW-METER AND INDICATOR

AN interesting modification of the regular U-tube manometer, now being placed on the market by the Meriam Company of Cleveland, Ohio, permits the instrument to be used as either flow-meter or as a pressure indicator. The illustration shows the new instrument as applied to a differential control system for gas and steam pressure, as used in a gas-heated steam heater, but there are many other types of equipment to which it can be applied.

Operation of the instrument depends upon the fact that all manometers operate upon the differential principle, whether rate of flow or actual pressure is indicated.

When a manometer is used to read pressure of liquids or gases, one of the arms is connected to the atmosphere and the other to the source of pressure to be measured. The difference produced in the liquid levels


Steam Line From Boiler
Gas Inlet
Outlet to Boiler
With This Cock Opened And Other One Closed Manometer Indicates Pressure On Regulator
With This Cock Opened And Other One Closed Manometer Indicates Pressure On Boiler
Size Of Manometer Is Determined By Pressure At Gas Inlet
With Both Cocks Open, Manometer Indicates Drop In Regulator

in the two arms shows the difference between the pressure measured and that of the atmosphere.

Each inch of difference in level indicates .036 lbs. per square inch pressure if the liquid used is water, or .491 lbs. per square inch if mercury is used. Other liquids give results proportional to their specific gravity.

When a manometer is used to indicate flow of liquids or gases, the two U-arms are connected one on each side of an alloy steel disc connected in the pipeline whose flow is to be measured. The steel disc has an orifice of known size, and this produces a definite drop of pressure for a given rate of flow. This drop is shown on the manometer, which is calibrated to read rate of flow.

In the accompanying diagram, it will be seen that with the left-hand cock open and the right-hand one closed, the manometer is between the gas line and the open air, and therefore reads gas pressure. With the reverse arrangement of the cocks closed, the manometer is connected to show pressure across the regulator—or, if a double scale and the measuring disc be also provided, the rate of steam flow.

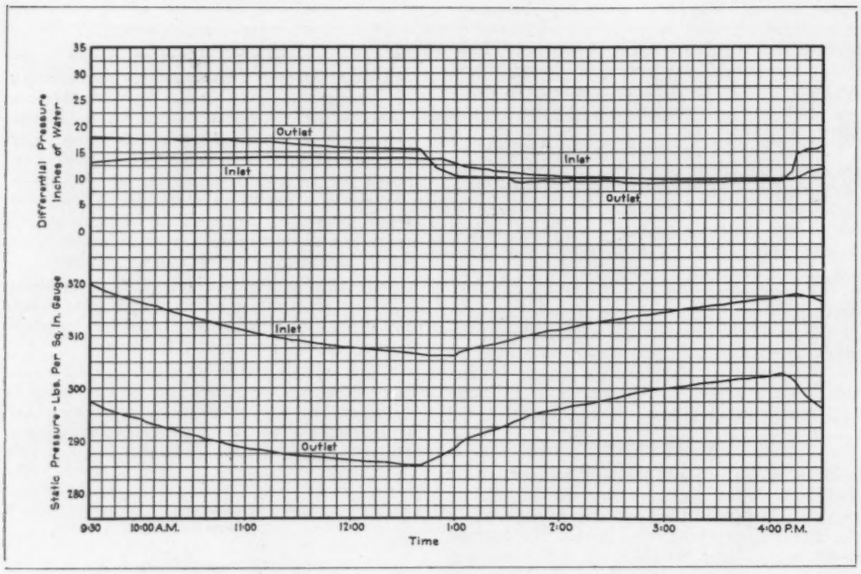


Figure 2. Record of pressure observations. Line "C." Feb. 27, 1927

Then, by substitution for the inlet volume,

$Q_m = 13{,}112.9 \sqrt{22.70 \times 151.71}$

= 769,517 cubic feet of gas per hour.

By substitution, for the outlet volume,

$Q_m = 13{,}112.9 \sqrt{25.16 \times 138.38}$

= 773,750 cubic feet of gas per hour.

Calculation of Volume with Weymouth's Pipeline Flow Formula

The calculation of the volume of gas flowing through the pipe line by Weymouth's flow formula was as follows:

Since $Q_c = 18.062 \frac{T_o + t_1}{P_o} \sqrt{\frac{(P_1^2 - P_2^2)\, d^{5\frac{1}{3}}}{GTL}}$,

Then, by substitution, and with L = 34.73 miles,

$$Q_c = 18.062 \frac{520}{14.4} \times \sqrt{\frac{[(151.71)^2 - (139.29)^2]\ (17.5)^{5\frac{1}{3}}}{0.597 \times 534 \times 34.73}}$$

= 769,283 cubic feet of gas per hour.

Comparison of Metered Volumes with Volumes Calculated from Weymouth's Pipeline Flow Formula.

In Table 2 volumes were used only to the closest 1,000 cubic feet and percentages to the closest one-half per cent. Comparisons of metered volumes with the volume calculated from Weymouth's flow formula for this section of pipe line are:

Since $\frac{Q_m - Q_c}{Q_c} \times 100$ = percentage of difference from Q_c,

where Q_m = measured volume, and

Q_c = volume calculated from Weymouth's flow formula, then, at the inlet meter,

$\frac{770 - 769}{769} \times 100 = +0.13$ percentage of (negligible) difference from volume calculated from Weymouth's formula.

At the outlet meter,

$\frac{771 - 769}{769} \times 100 = +0.65$ (practically ½) percentage of difference from volume calculated from Weymouth's formula.

DISCUSSION OF TYPICAL TESTS

Variation in the internal diameter of the pipe from the listed value and different degrees of roughness of the interior walls are two factors which influence the quantity of gas delivered by the pipe line. Pipe tolerances, usually referred to as a percentage of either the weight of the pipe or the thickness of the walls, can be obtained from pipe manufacturers. These tolerances, however, can not be used to determine the exact internal diameter of the pipe, since this diameter might be at any value within the tolerance, and varies throughout the length of the line within the range of the tolerance. Also, the diameter of a pipe line is not the same under different conditions of temperature and pressure. The magnitude of the effect of these several factors upon the actual delivery of a pipe line is not known, and variations of this nature are not considered in pipe-line flow formulas.

The field tests have been made under many different flow conditions. These include almost all conditions found in the commercial operation of pipe lines. Pipe lines ranging from 6 inches to 22 inches in diameter and operating under pressures ranging from 75 to 600 pounds per square inch have been tested. Table 2 compares 24 pipe lines under operating conditions between the measured deliveries and deliveries calculated from Weymouth's formula.

Constant Flow Conditions

Periods where the rate of flow in the line was the same at both the inlet and outlet, indicated by constant pressures at the two ends of the line, are best for making comparisons between the measured volume and that calculated from pipe-line flow formulas. When the line pressure was increasing or decreasing, the measured volumes at the inlet and outlet were different. The difference between these two volumes depends upon the difference between the rate of flow at the inlet and outlet. In many of the pipe lines, periods have not been obtained where the pressures at the two ends of the line were constant. Periods were then selected that had the smallest uniform increase or decrease in pressure. In many periods the amount of change in the inlet and outlet pressures was less than 1 pound per hour. Such periods were satisfactory for the purposes of the test.

When measurements of the volume of gas passing through the lines were made at both the inlet and outlet, comparisons were made between the volume calculated from the pipe-line flow formula and the metered volumes. Such comparisons can be made with either the inlet or outlet volume or with an average of the two. If conditions were such that only one measurement was made, it was essential that the flow conditions should remain more steady than when two volumetric measurements were obtained. With only one volumetric measurement it was impossible to measure the changes in the rates of flow between the inlet and outlet.

When the pressure remained constant at each end of the pipe line, the inlet and outlet pressures observed satisfied the requirements of the pipe-line flow formulas. However, if the change in the rate of flow was different at the two ends the pressure taken at any definite time at one end of a pipe line did not correspond with the pressure taken simultaneously at the other end; that is, there was an amount of pressure lag in the pipe line. The effect of this lag was minimized by the length of the period taken and by using periods where the amount of pressure change was small and the same at each end. The following examples show the effect of changes in the inlet and outlet pressures during the period of the test:

Line A (Table 2) is 38.02 miles long, 22-inch outside diameter pipe, and had been in operation two months when the tests were made. This line traverses nearly level country. There were four 20-inch main line gate valves, no sharp bends and no drips in the section tested. The gas flowing through this line was very dry. The major part of the gas had passed through a gasoline plant located approximately 75 miles upstream from the section tested. In test 1 the inlet pressure increased 0.7 pounds per square inch and the outlet pressure increased 0.5 pounds per square inch. The measurements at the inlet and outlet points showed that more gas was passing into the section than was leaving it, and confirmed the fact, indicated by the increase in pressure, that gas was being stored in the line. These volumes compare very closely with the volume calculated from Weymouth's formula; the inlet volume was the closer. In test 2 on the same line, the inlet and outlet pressures decreased 0.7 and 0.9 pounds per square inch, respectively, indicating a drain-

Series *of* Tests Deliveries *to* Gas Flow

(Continued

Made *on* Line Check H. P. Formulas

from Page 27)

age of the line; and the volumetric measurements showed that more gas was leaving than was entering the line. The inlet volume in this test also is closer than the outlet volume to the delivery calculated from Weymouth's formula.

Test periods were obtained on line C (Table 2) where the rates of flow were different. Over the period of time taken in tests 1, 2, and 4 the line pressures decreased at the two ends of the line, and in each case a larger volume of gas was leaving than was entering the line. The outlet volume in each test was closer than the inlet volume to the delivery calculated from Weymouth's formula. The pressures in test 5 were increasing and gas was being stored in the system. In this case, the inlet volume was closer to the delivery calculated from Weymouth's formula.

Figure 2 is a graphical record of the pressure observations taken on line C (Table 2) over a period of seven hours. From 9:30 a.m. to approximately 12:45 p.m. the differential pressure at the outlet decreased slightly and the inlet differential pressure remained constant while the static pressure at both the inlet and outlet decreased, indicating drainage of gas from the system. At approximately 12:45 p.m. the outlet differential pressure suddenly decreased, indicating a decrease in the volume of gas leaving the line. At the same time the inlet differential pressure did not decrease an equivalent amount, and more gas was entering than leaving the system, as indicated by increasing line pressures. From 3:14 to 4:05 p.m. the inlet and outlet pressures increased 2 pounds and the differential pressures remained constant. During this period gas was entering at the rate of 1,180 M cubic feet per hour and leaving at a rate of 1,133 M cubic feet per hour; or, gas was being stored in the system at a rate of 47 M cubic feet per hour.

Effect of Disturbances in the Pipe Line

Condensate, sand or rust either consolidated or in a finely divided state, and disturbances in a pipe line, cause increased frictional resistance to flow. Sand or rust adhering to the internal walls of the pipe also decreases the internal diameter. Line N (Table 2) contained a large quantity of both consolidated and finely divided rust caused by the internal corrosion of the pipe. Two test periods on two different days, when the flow conditions were nearly constant, were selected. The actual delivery from the pipe line for each test was approximately 48 per cent below the delivery calculated by substituting the observed values in Weymouth's formula. Rust was also present in line E (Table 2), and with constant flow conditions, the metered delivery was about 19 per cent less than the delivery calculated from Weymouth's formula.

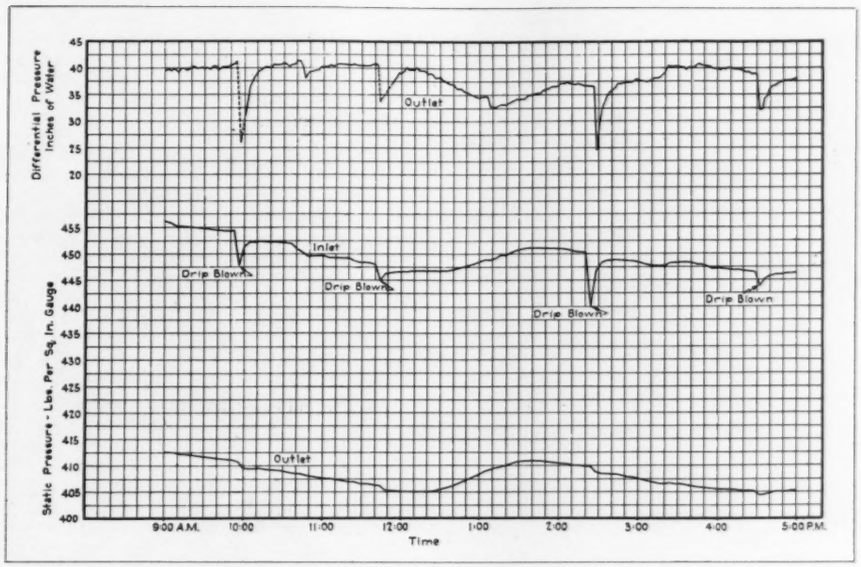


Figure 3. Record of pressure observations. Line "J." Nov. 7, 1927

Large volumes of condensate were present in lines J and M (Table 2). Figure 3 is a graphical record of the pressure observations made on line J. A large part of the gas entered this line directly from gas wells which were producing water with gas. The drip facilities at the wells were not adequate, and water entered the pipe line. A drip, located in line J about 2,000 feet downstream from the point taken as the inlet, trapped a large part of this water. However, much water passed on to low places in the line where drips were not provided. The drip mentioned was blown every few hours during the test. Figure 3 shows the effect on the line pressures at both the inlet and outlet whenever the drip was blown. The water located in the low places in the pipe line caused excessive pressure drop. The delivery from this line under a constant rate of flow was 41.5 per cent less than the volume calculated from Weymouth's formula.

Tests on Two Sections of the Same Pipe Line

Lines K_1 and K_2 (Table 2) are two different lengths of the same pipe line. Line K_2, 24.644 miles in length, includes the 18.015 mile section tested separately as line K_1. The entire line had been in operation only three days when the pipe-line flow tests were made.

Two test periods used in line K_1 showed the measured volume was 6 per cent less than the volume calculated from Weymouth's formula. The measured volume in line K_2, test 1, was 4 per cent less and in test 2 was 4.5 per cent less than the volume calculated from Weymouth's formula. The amount of difference between the measured volume and that calculated from Weymouth's formula in both sections is practically the same.

Effect of Different Rates of Delivery

For Weymouth's pipe-line flow formula

$$\left(Q = C\sqrt{\frac{(P_1^2 - P_2^2)\,d^{5\frac{1}{3}}}{G\,T\,L}}\right)$$

the quantity of gas delivered through any pipe line is proportional to the square root of the difference between the square of the inlet pressure and the square of the outlet pressure, or Q is proportional to $\sqrt{P_1^2 - P_2^2}$, if the other factors in the flow formula remain the same. It is assumed in the flow formula that C is the same for all values of $\sqrt{P_1^2 - P_2^2}$ or for all rates of delivery. Study has been made of the results shown in Table 2 to determine if C does remain the same for all rates of delivery. Comparisons of the percentage differences between the measured volumes and the volumes calculated from Weymouth's formula for different rates of delivery indicate that there is a variation in the proportional relationship between Q and $\sqrt{P_1^2 - P_2^2}$. However, sufficient data are not yet available to explain definitely the causes or the magnitude of these variations.

Special Tests on Flow Through 1-Inch Pipe

The tests that have been made on the various pipe lines tabulated in Table 2 all refer to pipes of large diameter. In order to obtain preliminary data on the comparison of measured flow of gas through pipes of small diameter with Weymouth's formula, an initial test was made on a 1-inch pipe under different rates of delivery. This test is only one of a series which will be made on small diameter pipes, and the results should not be considered conclusive. For the purposes of this set of experiments a commercial grade of hollow sucker rod was used. Two hundred and five joints of 1-inch tubular sucker rods with "upset" threads were screwed together and laid on level ground. The total length of the section tested was 4,100 feet. At each joint there was an 8-inch length where the internal diameter was reduced to carry threads. The internal diameter of the rods was 0.957 inch and the diameter at the reduced ends was 0.687 inch. Computations were made in order that the 136 feet of pipe having an inside diameter of 0.687 inch could be expressed in "equivalent length" of pipe having an inside diameter of 0.957 inch. The following formula based on Weymouth's flow formula, was used:

$$L_1 = L_o\left(\frac{d_1}{d_o}\right)^{5\frac{1}{3}}$$

Where

L_1 = equivalent length with diameter d_1,

L_o = given length of diameter d_o,
d_1 = diameter of equivalent length, and
d_o = diameter of given length.

The given length (L_o) with diameter 0.687 inch (d_o) is determined from the number of joints, or

$$205 \times \frac{8}{12} = 137 \text{ feet.}$$

Then from the above formula,

$$L_1 = 137\left(\frac{0.957}{0.687}\right)^{5\frac{1}{3}} = 803 \text{ feet.}$$

Thus the total length of pipe having an internal diameter of 0.957 inch equals

$$4100 - 137 + 830 = 4{,}766 \text{ feet.}$$

Residue gas from a gas-lift plant in the Seminole field, Okla., was used for the experiments on flow through 1-inch pipe. The specific gravity of this gas was 0.90. Tests were made under four different rates of flow. These tests and their results are given in Table 3.

TABLE 3 Flow Tests on 1-Inch Pipe

No.	Meter Readings				Flow Readings				Pressure drop, $P_1 - P_2$	Percentage from Weymouth's Formula
	P	h	T	Qm	P_1	P_2	T	Qe		
1	220.2	19.55	555.9	5669	220.2	14.4	549.4	6034	205.8	− 6.05
2	223.3	19.04	564.3	5595	223.3	55.0	552.8	5896	168.3	− 5.11
3	231.1	15.60	563.4	5151	231.1	116.9	552.1	5461	114.2	− 5.68
4	248.0	10.83	563.7	4447	248.0	182.2	552.8	4606	65.8	− 3.45

Where P = absolute static pressure, pounds per square inch.
h = differential pressure, inches of water.
T = absolute flowing temperature, °F.
Qm = volume measured at orifice, cubic feet per hour.
P_1 = absolute inlet line pressure, pounds per square inch.
P_2 = absolute outlet line pressure, pounds per square inch.
Qe = volume calculated from Weymouth's formula, cubic feet per hour.

For Table 3, specific gravity of the gas was 0.90, absolute pressure base was 14.4 pounds per square inch, and the gas coefficient for the orifice plate was 89.3 cubic feet per hour at 14.4 pounds per square inch absolute, 60°F. base and flowing temperature, and specific gravity of 0.90.

The results of these tests show a close agreement between the measured volumes and the volumes calculated from Weymouth's formula for the different rates of flow. In test 1 the gas was allowed to discharge from an intake pressure of 220.2 pounds per square inch absolute to atmospheric pressure, which was assumed to be 14.4 pounds per square inch absolute. Under these conditions the measured volume was 6.05 per cent lower than the volume calculated from Weymouth's formula. In tests 2, 3, and 4 the rate of delivery was regulated by means of a valve. The measured volume in test 4 was only 3.45 per cent below the volume calculated from Weymouth's formula.

CONCLUSION

In this report the discussions are limited to the results obtained from a few of the field tests. These tests deal with (1) different rates of flow through the same size of pipe, (2) obstructions, such as condensates, sand, or rust in the line, (3) flow through different lengths of the same pipe line, and (4) tests made when the input rate of flow was less than the output rate or when the output rate was less than the input rate.

Results indicate that under constant flow conditions with no obstructions in the line, the measured rates of delivery compare more closely with the rates of delivery calculated from Weymouth's pipe-line flow formula than with those calculated from any of the other pipe-line flow formulas. Where obstructions are present in the pipe, causing an excessive amount of friction, the actual delivery from the pipe line is always less than the delivery calculated from Weymouth's formula. On one line tested, the actual delivery was as much as 48 per cent less than the delivery calculated from Weymouth's formula.

The data available at the present time are not sufficient to establish definitely the effect of different velocities, diameters of pipe, types of joints, internal smoothness of the pipe, viscosity, supercompressibility, and chemical composition on the flow of gas through pipe lines. It is hoped that the final results of the pipe line flow study will establish the correct relations of all the factors affecting the flow of gas through high-pressure transmission lines.

ST. JOSEPH UTILITY COMPANY TO BE LARGE USER OF GAS

St. Joseph Railway, Light, Heat and Power Company, serving electricity to the city and operating the street railway system of St. Joseph, will receive natural gas from a 10-inch main now being laid by the St. Joseph Gas Company. The new line will connect with the Gas Company's system at the plant and will run north to the light plant located near the Missouri river. The power and light company expects to use between 70,000,000 and 80,000,000 cubic feet per month.

STANDARD CARBON CO., FILES ARTICLES OF INCORPORATION

Articles of incorporation have been filed with the Secretary of State of Wyoming for the organization of the Standard Carbon Company, which intends to manufacture carbon black from natural gas. The company is capitalized at $140,000, and the directors include P. B. Dykeman and O. N. Gibson of Riverton, Wyoming, and E. D. Edwards of Lander, Wyoming. Offices for the company will be located at Riverton.

The state of Wyoming ranks third in the production of carbon black from natural gas, according to recent reports.

SO. CAL. GAS CO. WILL SERVE NATURAL TO CENTRAL CALIF.

Announcement is made by the Southern California Gas Company, with headquarters in Los Angeles, that plans for serving natural gas to central San Joaquin valley towns are practically complete.

The company has started laying a 10-inch line from Kettleman Hills to Lemoore Junction. At that point the line branches, an 8-inch line going north to Fresno, and a 6-inch line to Visalia. It is also proposed to extend the Fresno line to Merced in the future. Completion of the system is expected some time in October, and the towns of Dinuba, Exeter, Hanford, Kingsburg, Lindsay, Parlier, Porterville, Reedley, Strathmore, Tulare, and Visalia, will be converted from a manufactured gas basis to a straight natural gas basis.

Another project contemplated by the Southern California Gas Company is that of laying a pipeline from Kettleman Hills to Elk Hills, about 75 miles distant. Surveys for this line are now being made. The purpose of this line would be to increase the available supply for the entire Southern California system of the company.

BUREAU OF MINES DEVELOPS GAS ANALYSIS APPARATUS

The Pittsburgh Experimental Station of the United States Bureau of Mines, Department of Commerce, has developed a gas analysis apparatus for use under certain conditions where extremely accurate analysis of gas mixtures is necessary. One difficulty with usual methods of gas analysis is found in the deviation of gases like carbon dioxide from the gas law. In the analysis of hydrocarbons this results in serious error in determination of the carbon dioxide contraction ratio. Other errors result from solubility of gases in absorbing solutions, inaccurate gas burettes, poor meniscus in the burette due to dirty mercury, absorption and occlusion of gases in the copper and copper oxide in the combustion tube, uncertain temperature and volume of dead space in the manifold, leaks and absorption of gases through stockcock grease and rubber tubing, etc.

PETROLEUM EXPOSITION DATES NEAR AT HAND

The International Petroleum Exposition and Congress, meeting under the direction of the American Petroleum Institute, in Tulsa, Oklahoma, October 5-12, will be marked by an increased attendance, and a larger number of exhibitors. All phases of the industry are to be covered, both in the sessions, and in the exhibits, many of the latter having been scheduled. Among these are pipe protective methods, and pipe welding, including forms of electric welding.

The new plant of the permanent Exposition is practically completed, and all modern facilities are being installed.

ARGUS GAS CO. HAS OFFICES IN DODGE CITY

The Argus Gas Company, holding 15 franchises for the service of natural gas in western Kansas, has established headquarters in Dodge City. Contract for the laying of pipelines has been awarded the Knupp-Fredell Company, and it is expected that gas will be supplied in the territory by November 1. Towns to be furnished with natural gas are: Elkhart and Rolla in Morton county; Moscow, Santana, Sublette, Montezuma, Ensign, Cimarron, Plains, Ulysses, Meade, Fowler and Dodge City.

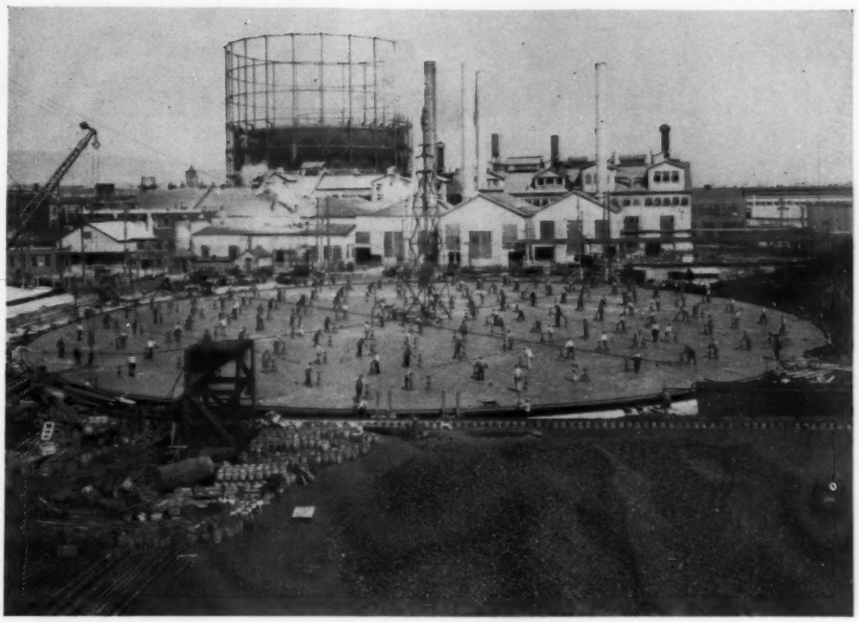
Texas Gas *for* Chicago *and* Middle West

FOR several weeks there have been persistent reports concerning the projected construction of a natural gas transmission line from the Texas Panhandle to Chicago and metropolitan areas of Nebraska, Iowa and possibly other sections in the middle west. Definite announcement has now been made of the organization of the Central States Natural Gas Company, under the laws of Delaware. This corporation will acquire natural gas rights and wells on 132,000 acres of land in the Panhandle from the Texas Company, the Phillips Petroleum Company, the Skelly Oil Company, and the Columbian Carbon Company. Directors of the new corporation will be: R. C. Holmes, president of the Texas Company; R. Ogarrio, vice-president of the same company; Frank Phillips, president of the Phillips Petroleum; W. G. Skelly, president of the Skelly Oil Company, and Reid L. Carr, secretary of the Columbian Carbon Company.

The new organization is a holding company in which all four of the units will hold stock. Details of the financial set-up of the combine have not been given out. Formation of a second company to collect and transport the gas obtained by the Central States Natural Gas Company, is reported to be under consideration.

Negotiations are understood to be under way between the newly affiliated natural gas interests and the Insull companies operating in the Chicago district looking toward the sale of natural gas for distribution throughout the city for industrial and domestic purposes.

On July 22 the announcement was made that A. O. Smith Corporation had received a contract from the Central States Natural Gas Company for 191,000 tons of steel pipe to cost approximately $18,000,000 for use in the construction of the pipeline to Chicago.



Lowering the floor of the new 8,000,000 cubic foot gas holder being built by the Bartlett Hayward Co. at the Oakland, California, plant of the Pacific Gas and Electric Company.

A. G. A. CONVENTION TO BE HELD IN NEW AUDITORIUM

ON October 14 to 18 of this year will be held the 11th Annual Convention of the American Gas Association.

The new Atlantic City Auditorium, in Atlantic City, New Jersey, will be the setting for the sessions as well as for all exhibits. This auditorium, but recently completed, is 675 feet long and 351 feet wide, and is capable of seating 66,000 persons. There are no columns in the main auditorium chamber, the ceiling and roof being supported by large trusses.

Of interest to men of the industry, the program will cover all phases of general, departmental and sectional work. Program for the general sessions has already been outlined, and the general program committee under H. C. Abell of New York, as chairman, is working up details of sectional and departmental sessions.

The Association is sending out full instructions concerning reservations for hotel rooms and exhibit space. Chester Grey is chairman of the Convention Hotel Committee, and is receiving requests for reservations for hotel accommodations at Suite No. 16, Central Pier, Atlantic City, New Jersey.

WESTERN GAS CO. HAS THREE NEW KANSAS FRANCHISES

Western Gas Company, with headquarters in Salina, Kansas, has secured franchises in Lincoln, Clifton and Clyde, Kansas, for the service of gas in those cities.

A. G. A. INDUSTRIAL ADVERTISING CAMPAIGN IS SET IN MOTION

According to John F. Weedon, chairman of the Advertising Committee of the Industrial Gas Section of the American Gas Association, plans are now progressing for the outdoor advertising campaign of the A. G. A., featuring gas for industrial use. Billboards will be placed in prominent places with the co-operation of gas companies throughout the United States, 32 companies already having signified their intention of using one or more boards. Many companies have not yet been heard from, as the work of organization has only just been inaugurated. Several western companies already have been approached on the subject, and have indicated their intention of cooperating in the campaign.

GEO. BOWERSOX SPENDS VACATION ON MOTORING TRIP

George Bowersox, utilization engineer of the Southern California Gas Company at Los Angeles, spent his vacation weeks on a trip into the north woods. Mr. Bowersox's trip took him over the scenic route through the San Joaquin and Sacramento valleys, into Oregon, over the Siskiyou Mountains, Crater Lake and the Redwood Highway.

C. B. BABCOCK RETURNS FROM NORTHWESTERN TRIP

C. B. Babcock, president of the C. B. Babcock Company of San Francisco, California, returned about the middle of July from an extended business trip throughout the northwest. Mr. Babcock reported that business conditions are greatly improved throughout the territory.

NORTHWESTERN NATURAL GAS CO. TO SERVE MABTON, WASH.

Northwestern Natural Gas Company was granted a franchise during the last week in June for the service of natural gas in the city of Mabton, Washington.

PEOPLES GAS LIGHT AND COKE CO. ISSUES HANDBOOK

The Industrial Relations Department of the Peoples Gas Light and Coke Company, of Chicago, Illinois, has published an attractive handbook for employees of the company and its subsidiaries.

The booklet is bound in leatherette, and contains information of value to employees on the following subjects: This Booklet and Its Purpose; The Company and the Public; Knowing Your Company; Company, Customers, and Employees; Some Privileges and Advantages; Employees Part in Better Business; and Directors, Officers and Organization. The company seal appears on the front cover.

ROSWELL, N. MEX., TO HAVE GAS DURING FIRST WEEK IN AUG.

Latest reports indicate that Roswell, New Mexico, will have natural gas service during the first week in August. The Pecos Valley Gas Company completed an 8-inch gas main on July 20, and several feeder lines are also constructed.

When the subsidary lines are finished, the Pecos officials estimate that 26,000,000 feet of open gas flow will be available for distribution in the various towns served by the company.

GAS SERVICE CO. SELLS 3,964 FURNACES IN SIX MONTHS

Combined new business departments of the Gas Service Company report the sale of 3,964 gas furnaces and conversion burners during the first half of 1929. A total of 843 large capacity space heaters have also been sold in the same length of time.

R. L. DIMMICK WANTS TO OPERATE PLANT AT KINGMAN, ARIZ.

R. L. Dimmick has applied to the Arizona Corporation Commission for permission to operate a gas plant in Kingman, Arizona.

Western Gas Salesmen's Competition

New Contest on Gas Radiator Sales

THERE is a style and kind of gas heating for every conceivable domestic heating need. Already the *Western Gas* sales contests have touched upon two types of domestic heating, and now a third —the gas radiator—is submitted as our new contest topic. *"How to Sell Gas Radiators"* should call for the best thought of the scores of salesmen whose names are already on our contest files—as well as those who are submitting entries for the first time. Gas radiators fill a large place in the heating load; their use presents many advantages—but we'll leave that to the contestants.

Up to date the *Western Gas* Salesmen's Competition has given our contestants an opportunity to present their sales ideas on gas furnaces and on radiant type heaters. The gas furnace contest brought an enthusiastic response from salesmen all over the West, and the winning replies, published in our July issue, were of high order. Salesmen from Missouri, California, and Washington divided the $50 prize money.

The radiant type heater competition is now at its peak, with the replies acceptable up to August 15. Winning entries will appear in this department next month.

Remember,—it is not necessary to decry other types of gas heating in the interests of selling a particular appliance. There is room for all heating applications, each in its logical place.

Contest results in the gas radiator event will be printed in the October issue. In many sections of the West, October is the first of the peak heating months, while at other points the heating rush is already well on. At any rate, the day is long past when gas appliance salesmen can afford to await the arrival of the first cold snap before calling on heating prospects. The salesman with the most presentable sales sheet is the one who is thinking heating the year around.

HOW ONE SALESMAN TURNS THESE CONTESTS TO ACCOUNT

We heard this month of a gas company salesman who is putting *Western Gas'* contests to good use. He adds the winning contest entries to his sales kit and works them into his solicitation when he strikes a prospect who won't be moved by the ordinary line. This gas company sales representative has even memorized the exact text of the winning gas furnace manuscript, published in our July issue, and has it ready to "turn on" when needed.

Conditions for Entry in Gas Radiator Contest

Subject: HOW TO SELL GAS RADIATORS

Each Contestant may have 300 words in which to give his ideas on how to sell gas radiators

Who May Compete: Any regular reader of WESTERN GAS who is engaged in selling gas appliances to the public, either through gas utilities or dealers.

Prizes: For the manuscript incorporating the best sales ideas on gas radiators, $25.00 in gold. For the second best manuscript, $15.00 in gold. For the third best, $10.00 in gold.

Contestants will be limited to 300 words. No mention of manufacturers products by trade name may be made, and contestants should refrain from comparing one manufacturer's product directly with another.

Manuscripts must reach publication offices of WESTERN GAS not later than *September 15, 1929.* Address all communications to *Contest Editor,* WESTERN GAS, 124 West 4th Street, Los Angeles, Calif.

Name, address, company affiliation and position of contestant must appear on each page of manuscript. Double-spaced, typewritten replies, printed on one side of sheet only, are preferred. Manuscripts become property of WESTERN GAS, to be published or withheld as desired, and no responsibility for their return is assumed.

Winning replies will be published in the October issue of WESTERN GAS and prize money paid to winners at that time.

Judging of replies will be conducted by Clifford Johnstone, Executive Secretary of the Pacific Coast Gas Association, assisted by a committee.

Monthly Contests: **In the September issue of *WESTERN GAS* another Salesmen's Competition, open to readers of *WESTERN GAS* (Prizes, $50.00 in gold) will be announced, the winning replies to be published in the issue of November, 1929.**

Radiant-Type Heater Contest Closes Aug. 15

ONLY a few days remain for getting in those late entries in the Radiant Type Heater Sales Competition. August 15 is the closing date and contestants who have delayed sending off their replies are advised to rush them by air mail.

There isn't a gas appliance salesman in the West but has his own ideas on "How to Sell Radiant Type Heaters." *Western Gas* will give $50 to the three salesmen who—in not more than 300 words—will incorporate the best sales ideas on this subject.

Don't Delay! Get your ideas on paper and air mail them to the Contest Editor!

Six Rules *for* Salesmen

SIX important rules for salesmen have been put forth by two prominent sales authorities, after extensive personal research into causes for failures of sales solicitations. These six fundamentals which have direct application to gas appliance merchandising, are well worth the attention of everyone engaged in sales work.

Professors R. C. Borden and Alvin C. Busse of New York University gathered their data from personal observation and actual records taken of 15,000 sales solicitations. They spent seven and one-half years gathering these data in their effort to discover the main reasons why sales are lost.

Briefly summed up, the six rules for the salesman are as follows:

1. Watch out that you don't talk too much; be equally as good at listening as at talking. Remember that your propsect has objections to make; let him voice those objections or they'll keep growing in his mind.
2. Never interrupt a prospect when he is talking, even though you know what his objection will be. That only serves to irritate him.
3. Don't slip unconsciously into an overpositive or argumentative attitude toward the prospect—even though you are one of his best friends.
4. Inquire first and attack afterwards. Ask the prospect to give his objections as soon as possible. Let him disarm himself quickly, giving you more time to overcome those objections.
5. When the prospect states his objection let him know that you understand him. Repeat his objections in your own words.
6. On the final, follow-through attack, base your argument on *one key-issue and stick to it.* Hundreds of sales are lost by trying to crowd in too many issues at the close of the solicitation.

Monthly Prizes: $25 *first*—$15 *second*—$10 *third*

A New Contest Announced Each Month--Read *the* Conditions

Oven Heat Control Winners Named

ANOTHER SALES CONTEST in the *Western Gas* series has come to an end and we present on this page the three premier answers to our question: *How to Sell Oven Heat Control.* Clifford Johnstone, executive secretary of the Pacific Coast Gas Association, who is directing the judging of these monthly contests for gas appliance salesmen, writes us the following letter announcing the winners.—*Editor.*

July 19, 1929.

Mr. Geo. H. Finley,
c/o Western Gas,

My Dear Mr. Finley:

I am returning to you herewith the essays submitted in your Salesmen's Contest on the Oven Heat Control, and take pleasure in announcing the following prize winners:

For 1st prize, W. W. Fitkin, Commercial Agent, Southern Counties Gas Company, Santa Barbara, California.

For 2nd prize, George J. Roe, Heating Department, Washington Gas & Electric Company, Tacoma, Washington.

For 3rd prize, Justin M. Kennedy, Special Representative, Southern Counties Gas Company, Santa Monica, California.

Mr. Fitkin was selected to receive 1st prize because, in addition to having a very well written paper, he has been able to include more arguments in it in favor of the oven heat control, than any other contestant. Mr. Fitkin mentions the utility of temperature in baking, in the preparation of oven cooked meals and refers to its use in oven canning and roasting.

Mr. Roe, winner of 2nd prize, also covers more ground than most of the other contestants, even though his paper is a short one. His arguments are direct and simple and he gives his prospect a brief glimpse of the mechanical workings of the regulator, which I am sure would appeal to an intelligent woman.

Mr. Kennedy's paper wins 3rd prize because of its general excellence, in spite of the fact that he does not mention oven cooked meals.

I particularly wish to mention papers submitted by Leonard R. H. Hardie of San Pedro, Calif., and L. G. Moore of Orange County, Calif., for honorable mention.

Yours very truly,
CLIFFORD JOHNSTONE

1st

W. W. FITKIN

Southern Counties Gas Company
Santa Barbara, California

"MRS. Prospect, I am sure you can appreciate the value of the oven heat control when I tell you that it takes the guess work out of baking and the preparation of oven cooked foods.

"Imagine, if you will, preparing a cake, placing it in this oven, setting your heat control to the proper temperature by the simple process of moving this dial, then proceeding with other household duties. After a few minutes you return to your range and remove a golden brown, perfectly baked cake that will give you a feeling of pride and satisfaction when it is served to your guests. Isn't that much simpler than the old process, of standing over the oven and testing the cake every few minutes with a broom straw?

W. W. Fitkin
Winner, Oven Heat Control Contest

"Another thing, the preparation of whole meals in the oven is not only simplified with the use of the oven heat control, but gives you a great deal of leisure time that you have never experienced before. You may place the entire meal in the oven, set the control at 250°, proceed to your afternoon tea or bridge party, returning home in the evening to find a perfectly cooked hot meal ready to serve immediately.

"I think you will agree with me that the advantages I have mentioned prove the value of the oven heat control, to say nothing of the use of it in connection with canning fruits and vegetables, roasting meats, and the preparation of fancy pattie shells and cookies.

"The oven heat control is simple and efficient, its use involves no danger of burning foods, no watching—it represents a silent and valuable servant in your household that will save you in fuel costs, and assure you of perfect results, thereby proving a constant source of joy and satisfaction."

2nd

GEORGE J. ROE

Washington Gas & Electric Company,
Tacoma, Washington

"MADAM, the oven heat control is one of the most useful of modern developments in baking. The time is not long distant when it will be included as standard equipment on all gas ranges. Today practically all bakeries, restaurants and commercial businesses of this type are using open heat controls. This control assures a constant heat at a predetermined temperature. It eliminates so-called 'oven-peeping,' because the only thing necessary is to set the control at the temperature recommended on the chart that accompanies the gas range, or by the cook book, and have the food bake the required number of minutes called for by the recipe. This elimination of 'oven-peeping' not only assures better success in baking but it also means a saving in foods and gas because there is less food spoiled and less gas consumed.

"The oven heat control also reduces the cost of baking through its thermostatic action in reducing the flame on the burner to a minimum as soon as the oven has reached the desired temperature. It saves time and worry because you can place the food in the oven, set the control and then go about your other household duties without any fear of the food's being overdone, underdone or burned. If you wish to do your shopping or go to a show, all that is necessary is to set the control at the lowest temperature and place the food in the oven. When you arrive home your dinner is all cooked and ready to be served. The oven heat control is truly your silent, efficient and economical assistant."

3rd

JUSTIN M. KENNEDY

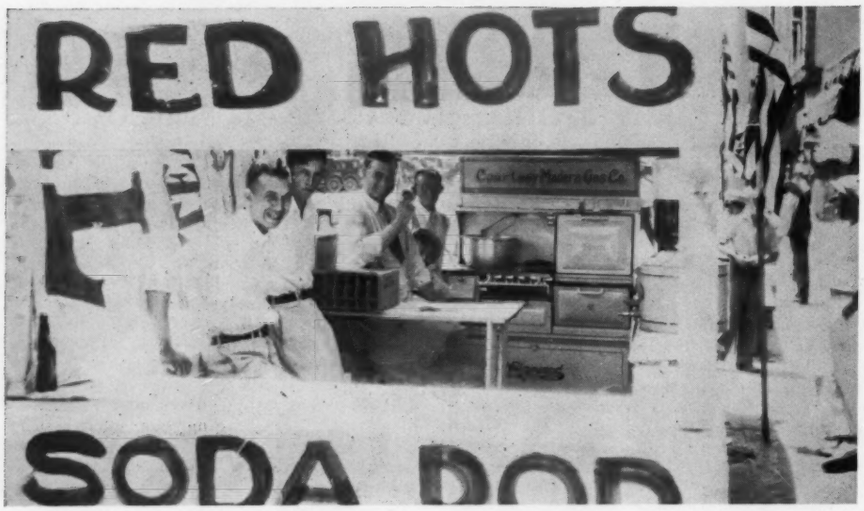
Southern Counties Gas Company,
Santa Monica, California

"WOULDN'T it give you considerable satisfaction, Mrs. Consumer, to know that your recipes would come out of the oven baked perfectly—every time? Many modern housewives are daily learning the secret of good baking—*automatically regulated heat.* A simple, yet never erring mechanical servant, the oven heat control assures the right temperature when you want it—as long as you want it.

"Did you ever wish that you didn't have to stay in the kitchen to watch the baking of the roast? This is no longer necessary if your range is equipped with this carefree convenience. Although you undoubtedly allow considerable time for preparing your meals, the greater freedom made possible by this control will enable you to continue serving the *same* delicious home-cooked foods. This thermostat merely eliminates all guess work, and permits you to go about your other activities secure in the knowledge that your dinner will be cooked to a turn.

"Nowadays one seldom considers anything other than a full enameled range, and don't you think this investment should be protected? The best possible insurance is an oven heat control—it will save the enamel

(Continued on Page 46)



No opportunity is lost to demonstrate the use of gas appliances in Turlock, California. A crowd of 3,000 witnessed this street demonstration on July 4, 1929. Tank gas, enclosed in a cabinet below the range, was used as fuel

Sales Methods Which Succeed *in* Small Communities

By A. A. CALDWELL
Manager, Turlock Gas Company
Turlock, California

SALES can only be made by getting the proper contact with the customer. Our salesmen call at the back door. Ringing door bells and finding that 50 per cent of the people do not answer is not the proper approach to a sale. Perhaps the lady of the house has on a kitchen apron and feels that she is not dressed for the front door caller; if this is the case, the back door is the better way and is closer to the appliances.

Let the salesman tell the customer that he represents the gas company and wants to look over her appliances and see that she is getting the proper service. Never fail to find out how long she has had her stove and compliment her on how well she has kept it. It brings up the point of durability. It may be that the customer has some personal grievance; by all means listen to her story until she has told you all her trouble. When she has finished ask her if she has met the manager; and if not, make an appointment for her. Tell her of the courtesy shown by the office force and have the office force pay especial attention to this customer when she comes in to pay her bill and do not forget that the meter or trouble-man may play a most important part in making her a satisfied customer. Thus she will finally be convinced not only that the company is anxious to give her the best of service, but that the individual employees are friendly. When this has been accomplished the salesman is in a position to advise her to purchase either more gas equipment or more modern equipment, but not before.

ELECTRICITY AT COST

The Turlock Gas Company of Turlock, California, faces competition with electricity furnished by a hydro-electric plant owned by a quasi-municipal corporation. This power company furnishes power and heat at approximately cost; fixing flat rates for water heaters and metered rates for stoves and space heaters. The issue between the two fuels is cleanliness as well as cost.

We are meeting this issue by the sale of closed-top modern gas ranges. We consider the closed-top stove to be the cleanest method of cooking known. We argue that, there being no exposed flame it would be impossible for dirt which might originate in an open flame to reach the walls of the kitchen. When compared with heat generated either in an electric range or in any other open burner the closed-top modern gas range is the cleanest method of cooking known. We point out that the stack draft from the gas range to the chimney carries away any carbons which might come from the use of gas as well as other floating substances which might be in suspension in the room, because the air is drawn under the closed-top and discharged with the products of combustion. We urge the customer to purchase a stove with an oven control and practically all of the stoves sold by the Turlock Gas Company and the Madera Gas Company are equipped with oven controls. In making an exchange of a closed-top gas range for an old equipment, we are willing, if necessary, to forego a profit in order that the customer might have a range which will satisfy her requirements of cleanliness, speed, durability and beauty.

Unless the gas company is able to remove the old water heater and put in a modern type storage water heater, an opening wedge has been left for the displacement of gas by another fuel. The salesman should lose no opportunity to present his arguments in favor of the gas storage automatic water heater—offering the customer an allowance for the old heater. In making the canvass, particular attention should be called to the safety devices on the modern gas storage heater.

If after his canvass he finds the party undecided, it is well to make an evening appointment at the gas office where he can demonstrate these modern conveniences, not only to the wife but to the husband as well.

The Madera Gas Company has installed on an automobile a modern closed-top gas range and a gas storage water heater, both removable at will. By the use of "liquid gas" carried in small high pressure tanks on the demonstration auto for heat, the stove and water heater can be demonstrated at the very door of the consumer.

We are proceeding on the theory that old gas equipment is as obsolete now as the first automobile manufactured, compared to the automobile manufactured to-day. Loss of consumers to other fuels is frequently caused by the lack of knowledge on the part of the consumers of the modern devices and of the great changes that have been made in gas ranges and gas storage water heaters.

From our experience with these two gas companies where billings for merchandise have averaged better than $13 dollars per consumer for the year of 1928, we are convinced that a majority of the people will be gas-minded for modern equipment providing it is properly demonstrated and properly advertised. When talking gas, talk "cleanliness' and prove your assertion!

HONOLULU GAS COMPANY HOLDS ANNUAL LUAU

Employees of the Honolulu Gas Company, of Honolulu, T. H., were recently entertained at the second annual luau held at the home of Senator and Mrs. Robert W. Shingle at Punaluu beach. The morning hours were given over to field sports, novelty races, boxing, swimming and volleyball. Dinner consisted of Hawaiian food, and an Hawaiian stringed orchestra provided music for the dancing which followed. Frank Q. Cannon is manager of the Honolulu Gas Company.

1929 Calendar

Southern California Meter Association—August 22, 1929.

Pacific Coast Gas Association. Annual Convention—Del Monte, Calif., September 10-13, 1929.

International Petroleum Exposition and Congress — Tulsa, Oklahoma, October 5-12.

American Gas Association—Atlantic City, October 14-19, 1929.

Utilities Association Secretaries of the United States—Chicago, December, 1929.

Winning Essay *on* "Why Gas *Is* Better"

¶ A discussion of a fuel that has successfully solved some of the greatest problems of the modern city.

By GEORGE M. SADLER

Los Angeles Gas and Electric Corporation

Geo. M. Sadler

AS ONE of its 1929 projects the Public Relations Section of the Pacific Coast Gas Association conducted an essay contest in which 576 gas company employees submitted manuscripts. Winners were announced in July. George M. Sadler of the Los Angeles Gas and Electric Corp. was awarded first prize—a trip to the annual convention of the P. C. G. A. at Del Monte, Calif., September 10-13. Mr. Sadler's essay is published on this page.—*Editor.*

ABOUT 2000 years ago, Plato, in his masterpiece, The Republic, discussed a remedy for the conditions of his time, and visualized an ideal state or community—a subject that has ever challenged mankind. Today the problems that confronted that ancient civilization have multiplied many times, and nowhere are these problems more insistent than in our great modern cities. The tendency of our era is a gradual abandonment of the rural districts and the rise of crowded cities with their manifold industries. The symbol of the might of these industries has ever been the smokestack pouring forth its smoke and soot. This has been accepted by all as the price paid for Industry.

Today in our land there is an awakened spirit. There is a nation-wide striving for ideal cities—beautiful and efficient. Teeming thousands, herded together by the common bond of earning a livelihood, are demanding an unpolluted atmosphere—the clean breath of city parks. Sunshine has become a recognized necessity to health. Smoke is no longer the symbol of Industry, but of Waste and Inefficiency. Traffic experts demand the elimination of unnecessary vehicles from the crowded streets. Women, a recognized force in Industry and Commerce, as well as the Home, demand feedom from that household toil that has even been their birthright—a freedom to live, to enjoy life, to stay young.

The solution of many of these problems is a modern fuel, and that is why Gas finds itself today in a most fortunate position. Its use means a clean civilization by the elimination of smoke. Its distribution in underground mains, unaffected by weather or traffic, eliminates coal and ash trucks from our crowded thoroughfares. In the home, its convenient, quick, hot flame, its tested appliances, its unlimited degree of regulation, have emancipated women. Its cheapness and efficiency attract outside industries into the city and solve their problems by reduction of the costs of production.

This new spirit of our time is nowhere more manifest than in the modern home. The kitchen is no longer a Bluebeard's den into which no one but the immediate family may enter. Rather, it has become one of the attractive rooms of the home. Its colorful gas appliances, guaranteed by the most exacting tests of the Gas Association laboratories, have produced the strange anomaly of releasing women from the drudgery of the kitchen and then making the kitchen so attractive that women can't keep out of it.

And in this modern home, gas has proven the perfect fuel. It is the essence of all other fuels, without waste, dust or ashes, always ready, clean, economical. Its quickness and accurate control have made cooking an exact science and a pleasure. The gas refrigerator has eliminated the long chain of intermediate equipment typical of the electric refrigerator. It is cheaper, and has no moving parts to lubricate or wear out. It has justified Steinmetz in saying that the future of refrigeration belongs to gas. The gas incinerator is driving out that relic of barbarism, the garbage can. Because of its perfect susceptibility to control, the gas heater is the safest, cheapest, quickest method of having hot water always on hand. Gas appliances heat the home with properly moistened air.

In the larger homes, apartments, hotels, and office buildings, gas has made the basement livable and clean. It has done away with dust and ashes and the worry over the purchase and storage of fuel. If steam is desired, gas will heat the boilers with economy, efficiency, quickness. Its control is entirely automatic, and accidents are unknown.

In the field of Industry, gas is performing its crowning achievement. Control is essential to all industrial progress. The regulation and control of the quantity and quality of heat is solved by gas. Gas has many advantages, any one of which means more to the finished product than the fuel bill itself—uniformity of product, minimum rejections, lessened labor and maintenance costs, low fire risks, and cleanliness of plant and product. In addition, it not only releases capital that would otherwise be tied up in fuel stock but also releases valuable space as well. It puts a flame in the heart of the factory—the boilers are not confined to the basement. It has brought efficient methods to baking, refining, steel treating, metal finishing, ceramic products, textiles and countless other industries. Judged by the cost of the finished product, it is by far the cheapest fuel and justifies the boast that "Gas makes it cheaper to make a better product."

Gas as a fuel is quicker than electricity and will do the work at a fraction of the cost, both in equipment price and operating costs. It is cleaner than oil, requires smaller combustion space, has no difficult burner adjustments, has none of the incidental expenses of handling, and is not paid for in advance. Coal and wood are primitive and limited to industries where controlled, refined heat is not necessary.

We have seen, then, that Gas is setting the pace for an awakened era. Its superb qualities have established it as the universal fuel. The Gas Industry realizes, however, that one of its greatest assets in the past has proved a weakness—its flexibility led to the improvising of appliances and equipment that were not always satisfactory. Anyone could devise some implement in which gas could be used. Realizing today that its future is dependent upon the success of the trade it serves and upon satisfied domestic customers, through tireless research work it is developing efficient industrial processes and perfecting household appliances. In each community its engineers are ever ready to solve the fuel problems of the domestic and industrial consumers. Its service is the hope of the city beautiful, the efficient home, the progressive plant. Its future lies unclouded before it, because of all fuels, Gas fulfills the insistent demand for cleanliness, quickness, economy, and perfect control.

It is as modern as tomorrow.

RATCLIFFE LEAVES GENERAL PET. NATURAL GAS DEPT.

Geo. L. Ratcliffe, manager of the General Petroleum Corporation's natural gas department, with headquarters at Los Angeles, is resigning that office, effective August 1, to become president of the California Talc Company of the same city. His place as manager of the natural gas department will be taken by R C. Wheeler, formerly general superintendent.

LEA COUNTY FIELD GAS SUPPLY DOUBLES IN FEW MONTHS

The supply of gas from Lea County gas field, from which El Paso gets its natural gas, has doubled since the beginning of construction of the line to that city, according to H. G. Frost, vice-president and general manager of the El Paso Natural Gas Company.

P. G. AND E. REPORTS DECREASE IN ACCIDENTS IN 1928

The Pacific Gas and Electric Company, with headquarters in San Francisco, California, has reported a reduction in lost-time accidents from 1,001 in 1925 to 445 in 1928, and the number of lost-time accidents per 100 employees from 8.86 to 4.56.

BERTHOUD, COLO. TO HAVE GAS FROM NEAR-BY WELL

Berthoud, Colorado, will receive natural gas from the Five Square Oil Company's well near there, according to a recent report. The line will be built from a new well brought in during the first week of July.

BYLLESBY ENGINEERING BUYS THERMOPOLIS SYSTEM

Byllesby Engineering and Management Corporation announces the purchase of the properties of the Northwest Power Company at Thermopolis, Wyoming. The new acquisitions consist of the natural gas field, pipeline and distribution system, in addition to power facilities.

ARIZONA EDISON REPORTS 11 PER CENT OPERATING GAIN

Arizona Edison Company, with headquarters in Phoenix, Arizona, reported gross revenue for the fiscal year ending April 30, 1928, of $1,627,260 over $1,512,701 for the previous fiscal period. Net operating profit was 11 per cent greater.

CONSOLIDATED GAS UTILITIES CO. ASKS TO SERVE BRAMAN

The Consolidated Gas Utilities Company has applied to the Oklahoma Corporation Commission for permission to serve Braman, Oklahoma, with natural gas.

Paul M. Downing V.-Pres., Gen'l Mgr., P. G. *and* E.

PAUL M. DOWNING, vice-president in charge of electric construction and operation of the Pacific Gas and Electric Co., has just been elected to succeed Frank A. Leach, Jr., in the office of vice-president and general manager of the company, effective July 31.

Mr. Leach retires from office after 31 years of service for this utility. Still in his middle 50's, he announces his retirement and that he intends now to enjoy some of the recreation that a busy life and the strain of public service have so far denied him. He plans, of course, to give some of his attention to his numerous private interests.

Paul M. Downing

Beginning work for what is now the P. G. and E. in 1898, as a clerk in the office of the Oakland Gas Light and Heat Company, he advanced steadily to become assistant to the late John A. Britton, then secretary and general manager of the Oakland company.

In 1904, when the Oakland Gas Light and Heat Company was consolidated with other companies to form the California Gas and Electric Corporation, with Mr. Britton at the head of the merger, Mr. Leach succeeded him as manager of the Oakland company. Later, when the P. G. and E. was formed, he was made manager of the new company in Oakland, Alameda and Berkeley, and other Alameda and Contra Costa County towns. This position he held for 16 years.

In 1920 he was made assistant general manager of the P. G. and E. A short time later he was promoted to the vice-presidency and upon the death of Mr. Britton in 1923 succeeded to the position of vice-president and general manager. During the six years he has held this office he has been instrumental in some of the greatest development work that the company has ever done in both its gas and electric departments

Upon the occasion of his resignation the Board of Directors of the company passed a resolution expressing its sincere regret at his decision to resign, recording his departure with reluctance and extending to him the best wishes of the Board, stock holders and employees for happiness and long life and the leisure he has so well earned

CAREER OF NEW GENERAL MANAGER

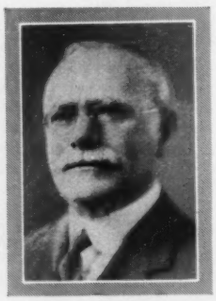
Paul M. Downing, vice-president in charge of electrical construction and operation, elected to succeed Mr. Leach, is also an old employee who worked his way up from the bottom.

In 1898 he became associated with the late John Martin, a pioneer in hydro-electric development in California, and after installing and operating several small electric plants for him took the management of the Colusa Gas and Electric Company, now part of the Pacific Gas and Electric Company system. In 1902 he was made Division Superintendent of the Bay Counties Power Company at San Francisco and in 1903 operating engineer of the California Gas and Electric Corporation, which with other companies was merged into the Pacific Gas and Electric system in 1905. He was made chief engineer of the electric department of the new company and in 1920 was elected a vice-president. Later he was also placed in charge of electric constuction, and given his present title of vice-president in charge of electrical construction and operation. In this capacity he had direct charge of the construction of two of the largest power houses in California, and at the present time is actively prosecuting work on a dam on the Mokolumne River, the largest structure of its kind in the world.

Mr. Downing recently retired as president of the Pacific Coast Electrical Association. He is a member of the Permanent Committee of the World's Engineering Congress, a member of the United States Chamber of Commerce and of the San Francisco Chamber of Commerce, a director of the Olympic Club of San Francisco and a former president of the Stanford Alumni Association.

Gas Industry Mourns Loss of William Baurhyte

THE entire gas industry of the west will mourn the loss of William Baurhyte, for 45 years prominently identified with public utility development in the west, who passed away at his Los Angeles home on July 4, 1929.



William Baurhyte

Mr. Burhyte was thought of affectionately as dean of the industry in his section. For several years he served with the Pacific Gas Improvement Company of San Francisco, leaving that post in 1903 to become second vice-president of the Los Angeles Gas and Electric Corporation of Los Angeles, later becoming vice-president and general manager of the same company. In February, 1924, he succeeded to the presidency, holding that position until his retirement from active work in March, 1928.

Holding membership in the Pacific Coast Gas Association since 1901, Mr. Baurhyte contributed much of his time and effort to the organization, becoming president in 1912, after having held many other important positions in the Association. From 1925 to 1926 he was also president of the Pacific Coast Electrical Association.

Salesmen's Competition

(Continued from Page 43)

and keep your range a lasting thing of beauty.

"Also consider the increased efficiency which results—no more gas is consumed than is needed. You appreciate, Mrs. Consumer, the necessity of measuring the food ingredients carefully, and it is equally important to have a thermostat which accurately measures the amount of heat units required to cook the food properly. Only oven controlled ranges permit the use of new recipes which give specific temperature requirements.

"Until you allow the heat regulator to relieve you of the responsibility of obtaining perfect baking, all of the worry in the world cannot achieve the desired results."

J. C. Diehl *is* Chief Eng. *of* American Meter Co.

ANNOUNCEMENT has been made of the appointment of John C. Diehl to the position of chief engineer of the American Meter Company, effective July 1.

Since 1919, Mr. Diehl has been an engineer with the Metric Metal Works Division, at Erie Pa. In that capacity he has been in charge of the Erie experimental laboratory, specializing in large volume, high pressure measurement.

As chief engineer of the American Meter Company Mr. Diehl will coordinate all experimental activities now being carried on in the several factories. He will also supervise the introduction of technical improvements in products, and promote in general any findings of value to the practical application of measurement engineering.

A frequent contributor of technical articles to gas and oil journals, John C. Diehl is also the author of the revised edition of the Natural Gas Handbook, 1927. He assisted the late H. P. Westcott in the Handbook of Natural Gas, 3rd edition, 1920; Measurement of Gas and Liquids by Orifice Meter, 2nd edition, 1922; Handbook of Casinghead Gas, 3rd edition, 1922.

Mr. Diehl was graduated in 1905 from Pennsylvania College, scientific course, and in 1910 from Massachusetts Institute of Technology, College of Civil Engineering.

Ella M. Lehr Now Head *of* Cooking Schools

Ella M. Lehr

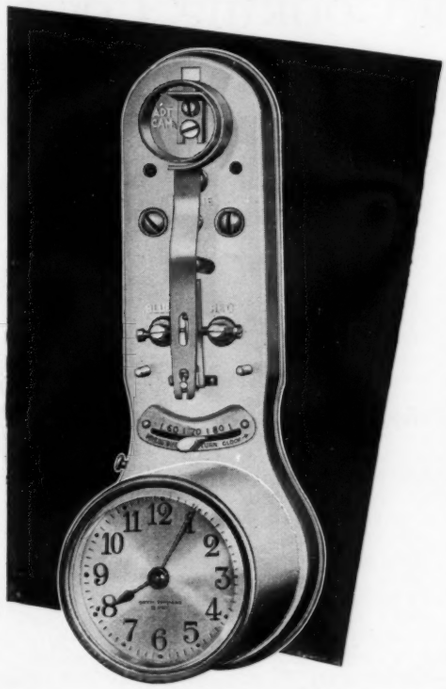
ELLA M. LEHR, formerly home service director for the Pacific Gas and Electric Company of San Francisco, California, recently resigned that post to become head of the Ella Lehr Cooking Schools. This organization is a form of promotion work built around home equipment and food products, and its aim is to carry a message directly into the home.

The cooking school is a three-day program of lecture-demonstrations with the home economist in charge working in a completely equipped portable kitchen. The new in food products and household appliances is shown in an educational manner. The school is known as the Newspaper Cooking School, working through local newspapers to maintain a helpful contact between the home maker and co-operating merchants and manufacturers.

Miss Lehr announces that the schools will be operated up and down the Pacific Coast.

ALCAZAR RANGE & HEATER CO. ISSUES DESCRIPTIVE BOOKLET

A new booklet has just been issued by the Alcazar Range & Heater Company, descriptive of its new No. 2000 Alcazar Supreme gas range. Some of the features as explained in this piece of trade literature include complete insulated oven, patented broiler drawer with drop door, as well as gas cocks located on a closed front control board.



The Snap Action Blade
and what it does

RELIABILITY in the room temperature control is essential to the success of any automatic heating system. Any failure of this important unit is sure to result in discomfort and inconvenience for the owner.

The Snap Action blade, an essential and exclusive principle in the Time-O-Stat Temperature Regulator, accounts in large measure for the lasting reliability of these instruments. It is true that the current carried in the circuit is comparatively small, but it is enough to cause miniature arcs if circuit breaking is not accomplished suddenly. Arcs cause burning and pitting of the contact points, and sooner or later, such action will result in sticking or failure to make contact at all.

The Time-O-Stat Snap Action blade operates on the same principle as wall switches carrying the lighting load, motion arising from the thermal element. It makes and breaks with a definite, decisive movement. Burning is reduced practically to zero, with resultant long life for the points and for the satisfaction of the owner.

This is but one outstanding feature which shows the care and long experience which has gone into the design of the Time-O-Stat Temperature Regulator. You can be sure that every part, every movement, has been created to give the maximum in satisfactory service. And, aside from the strictly mechanical design, there is a beauty, a harmony of line, about the instrument as a whole which is entirely in keeping with its excellent mechanism.

Full details about this room temperature control may be had for the asking. Our engineering department will be only too glad to show you how this instrument may be applied to the correct solution of your room temperature control problems.

TIME-O-STAT CONTROLS COMPANY
ELKHART, INDIANA

Win Commercial Cooking Load

(Continued from Page 30)

feature of permitting operation from one set of burners as a unit, if desired. It is equipped with indicating pyrometers as a check on the thermostat. It poduced excellent results in our preliminary tests and was installed in one of our larger cafeterias, displacing an electric bake-oven of the latest type. Here again we were able to show progress by having the proper appliance to satisfy an urge.

We will dominate the fuel field by having favorable conditions at the point of sale, the appliance. We were not solicited on any of these appliances and it was necessary for us to canvass all of the appliance manufacturers and jobbers. Our company is anxious to see a concerted effort put forth for the improvement of fuel applications in the volume cooking class and believes that an interchange of ideas among gas companies would prove beneficial to the industry as a whole. The need for this was apparent at the Pacific Coast regional convention of the National Restaurant Association.

Three gas companies exhibited jointly at this convention, held recently in Los Angeles, and gas representatives were agreeably surprised at the interest shown in our appliances by all of the delegates. Operators from San Francisco, Oakland, Seattle, Vancouver, San Diego and many other western cities eagerly sought information on some of the newer appliances.

There is a chain of restaurants operating all along the Pacific Coast, some 28 in number, that are electrically equipped throughout. One of these stores, and possibly the largest, is located on our system in the city where the owner of the chain resides. It is interesting to you gentlemen to know that this cafeteria was completely changed over to gas a few months ago—even to the extent of thermostatically controlled coffee urns. Now the management called upon us to control his dishwashing machine by thermostat. It seems to me that this information would be of value to the sales organizations of the companies who desire to serve the other 27 stores. Many other instances could be mentioned where gas company new business departments could profit by exchanging information with similar departments in companies located at other points.

Our salesmen are filled with confidence and enthusiasm in our product, gas, but it is necessary for them to have the proper weapons to combat competition, and those weapons are up-to-date appliances.

Note: The following paragraphs summarize other important aspects of hotel and restaurant sales, as brought out in discussion in the regional meeting of the Pacific Coast Gas Association Commercial Section at which Mr. Leahy's foregoing paper was delivered. George H. Heckler, supervisor of the hotel and restaurant division, Southern California Gas Company, reviews this discussion for *Western Gas.—Editor.*

Many of the newer appliances in this field of bakery, hotel and restaurant cooking class as excellent load builers, of good load factor, but the primary service the modern applications are rendering is that they enable the gas company to hold and increase a load which would otherwise be lost to competitive fuels whose representatives have gone about it to develop their appliances to maximum efficiency.

To a large extent the gas fraternity has the electric industry to thank for its modern appliances for bakery, hotel and restaurant use. Necessity has truly been the mother of invention, and gas appliance manufacturers have in recent time enabled the new business representative of the gas company to offer appliances which have no equal.

Mentioning only a few of the specialized appliances in this field, which give gas the edge on all competition, there is the bake oven recently introduced, heavily insulated though portable, with each deck thermostatically controlled. This combination represents flexibility and economy such as can be secured with no other fuel.

Our modern burners with automatic control eliminate over or under-heated steam tables, and, under coffee urns, prevent spoiled flavor due to boiling.

Adaptation of the radiant principle in such appliances as the Rotisserie, has brought even application of heat for meat or fish "short orders," retaining savory juices, browning the outsides, and insuring a flavor which surpasses in tastiness that attained through use of charcoal.

A gas burning deep fat fryer now on the market saves 50 per cent in fat and gas consumption due to insulation and thermostatic control, and at the same time eliminates fire hazard.

When the remark was made earlier in this discussion that these newer appliances will enable the gas company to hold and increase the baking, hotel and restaurant business, one all-important assumption was made as a basis for the statement—that the company maintain a definite, periodical service for this load. Antiquated appliances must be replaced at the psychological time, and the modern application must be kept at 100 per cent operating efficiency. On such a basis, with intelligent sales contact, gas will retain an undisputed leadership in this profitable field.

NORTHWEST TEXAS GAS CO. GETS COALGATE PERMIT

The Northwest Texas Gas Company of Vernon, Texas, has been granted a franchise to supply natural gas at Coalgate, Texas. Service is expected to be established by the end of the summer.

COAST COUNTIES GAS & ELECTRIC ASKS TO SERVE SAN BENITO

Coast Counties Gas and Electric Company, with headquarters in Santa Cruz, California, has applied to the California Railroad Commission for a permit to exercise franchise rights in the county of San Benito for the distribution of natural gas.

FRANK R. COATES ATTENDS COLO. PETROLEUM CONFERENCE

Frank R. Coates, head of the Oil and Natural Gas Division of Henry L. Doherty and Company, was a recent visitor in Colorado Springs, Colorado, where he attended the petroleum conference of governors called by President Hoover.

P. G. AND E. REPORTS GOOD GAIN IN REVENUE

Pacific Gas and Electric Company, with headquarters in San Francisco, California, reports gross revenues for the fiscal year ending April 30, of $63,075,695. The P. G. and E. now serves 1,009,867 consumers.

Henry C. Morris

Natural Gas Department Nominations

THE Nominating Committee of the Natural Gas Department makes the following nominations to be voted upon by the Natural Gas Department at its meeting in Atlantic City October 16 next, during the annual A. G. A. convention.

For Chairman: Henry C. Morris, president, Dallas Gas Company, Dallas, Texas.

For Vice Chairman: H. C. Cooper, chief engineer, Hope Natural Gas Company, Pittsburgh, Pa.

For Members of Managing Committee, Two Year Term: L. K. Langdon, Cincinnati, Ohio; H. L. Montgomery, Bartlesville, Okla.; J. B. Tonkin, Pittsburgh, Pa.; M. W. Walsh, Louisville, Ky.; Wm. Moeller, Jr., Los Angeles, Calif.; Geo. E. Welker, Oil City, Pa..

For Member Managing Committee, One Year, to fill unexpired term of H. C. Cooper, J. R. Munce, Pittsburgh, Pa.

(Signed) A. W. Leonard, Chairman;
J. D. Creveling,
H. J. Hoover.
Nominating Committee, Natural Gas Department.

Furnace Design

(Continued from Page 23)

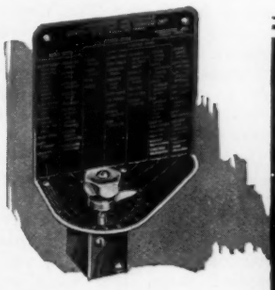
in the morning. The walls of the furnace should be structurally strong enough to stand repeated heating and cooling without distortion and should also be able to carry the load of the arch. In the larger furnaces, too, the heat storage capacity of a 9-inch wall will result in a higher furnace temperature after a night's shut down and will also aid in maintaining the furnace temperature as cold work is put through.

DURANGO CELEBRATES ADVENT OF NATURAL GAS

On Thursday evening, June 20, the Durango Natural Gas Company turned natural gas into its mains between the Ute Dome and Durango, Colorado. Gas will be used for domestic, industrial and commercial consumption. Celebration was held on Tuesday and Wednesday, June 18 and 19.

The Autostat, an exclusive feature, shuts the gas off completely when the correct oven temperature is reached so that cooking will be completed on stored heat. This is but one of the major "talking points" exclusive to this range.

Setting the Stage for Gas Range Selling



We live in an age in which "romance" is a big factor in selling. By that we mean that the purchases of the public are largely influenced by the selections of prominent people and prominent institutions. Moreover, in a cooking appliance, the public is deeply concerned with health arguments such as the retention of vitamines and food salts.

It is difficult for a dealer to set the stage unaided in creating a romantic glamor around the products he sells. The manufacturer must do it for him.

In this respect, the stage is set elaborately for the sale of Chambers Autostat Gas Ranges.

COOKS WITH THE GAS TURNED OFF

Awarded the Grand Prize, Paris, 1928. Endorsed by leading cooking institutes and by American Gas Ass'n.

ST. VINCENT'S HOSPITAL
LOS ANGELES
SMALL VIEW OF
DIETICIAN'S DEPARTMENT

This illustration with endorsement from hospital management is appearing in Chambers national advertising.

The Factory organization provides Chambers Dealers generously with forceful sales material. Endorsements from notable hospitals, apartment houses, cooking institutes and distinguished American housewives are used liberally in "dramatizing" this exceptional gas range.

In addition, the Dealer has a cooking appliance that outperforms all others in convenience of operation, in gas and food savings, in all around efficiency.

That is why you should investigate the Chambers proposition if this range is not already represented in your territory.

THE CHAMBERS MFG. COMPANY

24 Columbus Park **Shelbyville, Indiana**

Originators of the insulated gas range, the Thermodome and the Autostat

Appliance Manufacturer Finds Radio Productive Medium

An artist's sketch of the window display card which the Jas. Graham Mfg. Co. is preparing to supply gas companies and dealers in connection with its radio broadcasts.

THE newest medium to make its appearance in the advertising field is, of course, the radio. Although radio advertising has become a common thing in the past few years and although it is touted by certain enthusiasts as the most profitable and lowest priced "circulation" obtainable, there is still much questioning as to what kind of programs people will actually listen to, as to how much advertising talk they will stand for, as to how some accurate check may be had on the results obtained, and as to what hour of the day or night is most suitable for the presentation of a program designed to appeal to a certain type of listeners.

The Pacific Coast Gas Association is ready to launch a test campaign of an institutional nature, as described elsewhere in this issue. The trail has already been blazed for gas advertising by radio, however, by one Pacific Coast institution, the Jas. Graham Mfg. Co., which has had almost a year's experience in talking into the "mike" to the invisible audience of the air. Starting the campaign with little to guide them except their willingness to try out a new and apparently profitable medium, this company has kept careful record of the various steps involved in creating a successful campaign, and much of the information gained should be of interest to the gas industry.

The first programs were just sent out. There was nothing in the way of publicity to herald their coming, and no method of making a check or following up the results obtained. Doubtlessly, many housewives heard the programs, but with no incentive supplied for them to write in to the company, it was practically impossible to gauge the results. Inasmuch as the half-hour is called the "Wedgewood Cooking School of the Air," it was decided that communications from interested parties could be encouraged by the distribution of free cook books.

To say that the sponsors of the program were surprised at the immediate response is putting it mildly. The first month, which consisted of four weekly broadcasts, saw requests for over 1500 of the books and in the eight months that have elapsed since then, an average distribution of over 1000 a month has been mailed out in response to letters of request.

Dealers were somewhat apathetic to the idea at the outset and apparently made no particular effort to tie up with the boadcasts. To overcome this, the Wedgewood salesmen worked with the dealers, explaining the importance of the programs, and the company supplied them, free of charge, with envelope stuffers. As the interest has grown, the demand for this type of dealer literature has increased until now the Jas. Graham Mfg. Co. is supplying them in thousands to dealers up and down the Pacific Coast

With each cook book mailed is a return addressed postal card on which the housewife is requested to give certain data concerning the state of her present cooking equipment. About 30 per cent returns has been the average on these cards, and from them is built up a complete prospect list, divided geographically. Prospects' names are forwarded to the salesmen traveling the territory and dealers or gas companies for follow-up.

It is the opinion of the company that radio advertising reaches its greatest effectiveness in the small towns and rural communities. In connection with the weekly talk, the woman who broadcasts manages to mention several times during the half hour, features of the new modern type of range with closed top, full enameled ovens and oven heat control. There are a number of instances where inquiries have been received, describing one range or another that the woman has never actully seen, but has merely visualized from the description she has heard in the program.

Each individual program has featured some particular recipe or cooking problem, presented in such a manner as to afford the opportunity of calling attention to the various selling points of the range, and to gas as the ideal fuel for cleanliness and convenience.

It has been the attitude of the company from the outset that the biggest job to be accomplished is that of selling thoroughly the idea of gas heating used in a modern way. While the trade name of the company's stove is mentioned frequently throughout the program, it is always mentioned incidentally. The idea that is religiously followed is that here is a woman talking to other women, giving them helpful cooking suggestions and telling them many shortcuts to lessen the time spent in the kitchen.

Interspersed throughout the half hour are musical numbers. There has been comment both favorable and unfavorable on the musical part of the program, but in this matter the advertiser must always continue to feel his way and be constantly watching the volume and contents of letters received, attempting to make his offering most satisfactory to the largest number.

As a matter of comparison it might be mentioned that while the $350 a week on the air brings in no less than 250 replies to every program, a $400 advertisement in a metropolitan paper claiming a large circulation in outlying districts, and offering the same free cook book to those who would write in, brought four replies.

As additional proof that the message of gas, the ideal fuel, is being effectively promulgated, it might be mentioned that a considerable number of requests have been received for information concerning the various types of compressed fuel now being marketed in districts where gas service is not yet available.

Radio advertising undoubtedly has its limitations, but here is the record of one company that is convinced that it has been a profitable and far-reaching advertising investment.

CITIZENS GAS CO. ASKS FOR LOVELAND, COLO., FRANCHISE

The Citizens Gas Company, a new organization, has applied to the city council of Loveland, Colorado, for a permit to sell natural gas in the city of Loveland. The Northern Colorado Public Utilities Company had also submitted a franchise proposal to serve the town.

FLAGSTAFF PROJECT IS NOW DEFINITELY ABANDONED

The project to construct a gas plant at Flagstaff, Arizona, has been definitely abandoned, according to a report made public by J. R. Donovan, manager of the Flagstaff Gas Company.

W. M. Thompson *N. R. McKee*

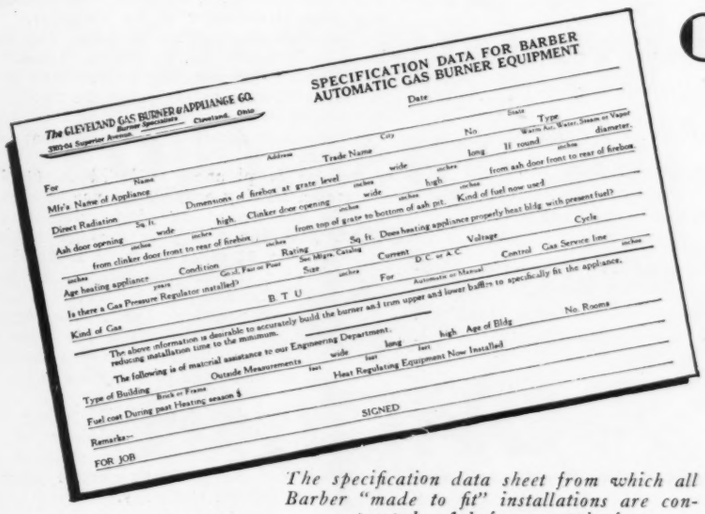
THOMPSON AND McKEE FAMILIES ON HAWAIIAN TRIP

Norman McKee, purchasing agent for the Southern California Gas Company of Los Angeles, California, and W. M. Thompson, president of the Reliance Manufacturing Company of Alhambra, together with Mrs. Thompson, Mrs. McKee and daughter Jean, left July 27 for a three-weeks visit to the Hawaiian Islands. Mr. McKee and Mr. Thompson were anticipating several good golf matches with Frank Q. Cannon, manager of the Honolulu Gas Company, Ltd., of Honolulu, and E. S. Jones, engineer with the same company.

CLEIGH POWERS TRANSFERRED TO EVANSTON, WYOMING

Cleigh Powers, cashier of the Rocky Mountain Gas Company in Rawlins, Wyoming, was recently transferred to the Evanston, Wyoming, office of the company.

Every Barber Installation Is "Made to Fit"



The GLEVELAND GAS BURNER & APPLIANCE CO.
Burner Specialists
3702-04 Superior Avenue, Cleveland, Ohio

SPECIFICATION DATA FOR BARBER AUTOMATIC GAS BURNER EQUIPMENT

Date

For Name Address Trade Name City No. State

Mfr's Name of Appliance Type Water Ht. Water, Steam or Vapor

Direct Radiation Sq. ft. Dimensions of firebox at grate level inches wide inches high inches long If round inches diameter.

Ash door opening inches wide inches high Clinker door opening inches wide inches high inches from ash door front to rear of firebox

inches from clinker door front to rear of firebox inches from top of grate to bottom of ash pit. Kind of fuel now used

Age heating appliance years Condition Good, Fair or Poor Rating Sq. ft. Does heating appliance properly heat bldg. with present fuel?

Is there a Gas Pressure Regulator installed? Size inches See Mfrs. Catalog For Current Voltage Cycle

Kind of Gas B T U D C or A C Automatic or Manual Control Gas Service line inches

The above information is desirable to accurately build the burner and trim upper and lower baffles to specifically fit the appliance, reducing installation time to the minimum.

The following is of material assistance to our Engineering Department.

Type of Building Brick or Frame Outside Measurements feet wide feet long feet high Age of Bldg. No. Rooms

Fuel cost During past Heating season $ Heat Regulating Equipment Now Installed

Remarks—

FOR JOB SIGNED

The specification data sheet from which all Barber "made to fit" installations are constructed. Ask for a supply for your salesmen.

Good Conversions or Bad Ones?

The gas company must decide.

With the lowering of gas rates in many localities and the public demand for the simplicity, cleanliness and flexibility of gas fuel, conversion installations have become an important factor in building the house heating load.

There are bad and good installations. The old style makeshift job, inefficient and costly to maintain, is a constant menace to the advancement of gas as a heating fuel.

Illustrating installation of No 300-R Automatic Barber Burner in a round Hot Water or Steam Boiler.

There is a right way. Every installation must be made to fit from specifications and measurements secured by the gas appliance salesman. Only then can the consumer be assured of efficiency, economy and all-round satisfaction with his new fuel. The blanks provided for this purpose are the result of years of careful research and contain the exact information necessary to produce a scientifically correct gas heating plant.

The high standing which the company enjoys is due entirely to the scrupulous care put into each unit that leaves the factory, together with the cooperation and continued interest which it manifests *after* the burners are sold.

Write us at once for complete information and discounts

The GLEVELAND GAS BURNER & APPLIANCE CO.
Burner Specialists
3702-04 Superior Avenue. Cleveland, Ohio

BARBER *Automatic* JET GAS BURNERS

First P.C.G.A. Broadcast Ready

(Continued from Page 21)

In future talks I hope to be able to give you ideas and help that I feel sure you will find valuable and that you can put into practice in your own homes. I will take up the subject of the different kinds of cooking, the latest and best ways of doing a number of the everyday household tasks; how to heat your home most efficiently and most economically, and I will certainly not overlook a period devoted to singing (don't be alarmed, I don't mean *literally* singing) the praises of the emancipator who brought constant running hot water into our homes!

We'll also consider the laundry problem, and that new inexpensive luxury beyond compare—the gas refrigerator. I'll tell you about the way it preserves foods and keeps the left-overs at a germfree temperature, and I'll tell you how to make some very attractive desserts, too.

Ventilation is going to come in for some discussion—too, and *bathing*. If any of you believe that the topic of bathing may be covered in a paper the size of a wash cloth, you have a surprise coming!

I will tell you, too, how many women are making their kitchens the most attractive room in the house, and on another occasion I will address myself especially to those of you who hope to buy or build a home. I'd like to tell you what to think about and look for in its plan and design.

And you will hear, too, some of the most *interesting* things about gas and what it can do for you through the medium of the marvelous modern appliances—bringing comfort to you and yours, lightening the housework, saving time, labor and money.

And there are some advantages abroad in the land today, some inventions that at first thought appear simply impossible. For example, do you know that manufacturers have recently developed a *combination* gas range and refrigerator? To me, this latest invention is just about the most extraordinary product of the last 10 years. But you have no idea of how practical and useful it is, especially in a small kitchen where space must be conserved.

And now, here's some extra good news. Next week I shall announce a most attractive free offer by your gas company—one that I know you will hail with pleasure and want to take advantage of right away. It is a *gift* to you, outright, and one that you will find useful every day of the week. So be sure to tune in again next Wednesday.

This feature of the Woman's Magazine of the Air (sponsored by your own gas company) will begin every Wednesday morning at 10:50, so let us plan to meet each Wednesday morning at that hour, and I am sure that you will find our meetings profitable. Next Wednesday, for instance, we will discuss the newer, easier canning methods with the use of gas. Au Revoir!

Dates and Subjects for P.C.G.A. Radio Talks

*—Indicates offer of recipe booklet.

**—Indicates offer of free adjustment service.

* **—Indicates both of above offers.

Talk No. 1—August 14—"Gas—The Modern Fuel for Modern Homes."
Talk No. 2—*August 21—"Oven Canning".
Talk No. 3—**August 28—"Cooking"—General.
Talk No. 4—*September 4—"Oven Heat Control."
Talk No. 5—*September 11—"Gas Refrigeration."
Talk No. 6—*September 18—"Oven-Cooked Meals."
Talk No. 7—September 25—"Hot Breakfasts."
Talk No. 8—* **October 2—"House-heating"—General.
Talk No. 9—**October 9—"Fireplaces."
Talk No. 10—October 16—"Heating Individual Rooms."
Talk No. 11—*October 23—"Top Cooking"—General.
Talk No. 12—*October 30—"Cooking Vegetables."
Talk No. 13—**November 6—"Water Heating"—General
Talk No 14—*November 13—"Baking"
Talk No 15—* **November 20—"Roasting."
Talk No 16—November 27—"Dishwashing."
Talk No. 17—*December 4—"Waterless and Pressure Cooking."
Talk No. 18—December 11—"Bathing."
Talk No. 19—*December 18—"Gas Refrigeration."
Talk No. 20—December 25—"Planning the Home."
Talk No. 21—January 1—"Home Decoration'.'
Talk No. 22—January 8—"Laundering."
Talk No. 23—*January 15—"Tea and Coffee Brewing."
Talk No. 24—**January 22—"Ventilation and Health"
Talk No. 25—*January 29—"Refrigeration."
Talk No. 26—* **February 5—"Appliance Maintenance."

Pacific Coast Gas Ass'n Essay Contest Results

(Continued from Page 33)

Participation in the Essay Contest by Companies

Los Angeles Gas and Electric Corporation	338 Essays
Pacific Gas and Electric Company	94 Essays
Portland Gas & Coke Company	58 Essays
Southern California Gas Company	38 Essays
Southern Counties Gas Company	23 Essays
San Diego Consolidated Gas & Electric Co.	13 Essays
Seattle Lighting Company	8 Essays
Northwest Cities Gas Company	3 Essays
Tucson Gas, Electric Light & Power Co.	1 Essay
TOTAL	576 Essays

LITTLETON-BOULDER NATURAL GAS PIPELINE STARTED

Construction of the Littleton to Boulder unit of the Colorado-Wyoming Gas Company's natural gas pipeline from the Amarillo-Denver line was started during the first week in July, according to an announcement by C. J. Shortess, vice-president and general manager of the company.

From Littleton to Boulder the line will be a 10-inch carrier. North of Boulder it will be an 8-inch line. Plans have been made to run a 25-mile extension of the main line to Greeley, where natural gas will be made available for domestic and industrial consumption.

It also is planned to build to Golden, Colorado, making possible the use of natural gas in the homes and industries of that town. The line will pass through Mandalay Gardens, 12 miles north of Denver.

Edgewater, immediately west of the Denver city limits, also will be served, as will Arvada, and Boulder. The Public Service Company of Colorado has a franchise for the distribution of natural gas at Boulder. Fort Logan also will be supplied from the line.

Eventually the Colorado-Wyoming Gas Company, which is a subsidiary of the Cities Service Company, hopes to make gas available for the Valmont electric plant of the Public Service Company.

CITIES SERVICE TO BUILD LINE TO FORT SCOTT, KAN.

An 8-inch natural gas pipeline, approximately 50 miles in length, will be constructed from the compressor station of the Cities Service Gas Company in Petrolia, Kansas to Fort Scott, Kansas. Work on this project will begin as soon as the survey is completed and natural gas will be turned into the line by November 1, company officials announced late in July.

This project involves the purchase of the the pipelines and production of the Union Gas Company, from which Fort Scott has been receiving its supply, and which will continue in operation. In addition to furnishing Fort Scott with natural gas for both domestic and industrial consumption, this service will also be available to Nevada, Missouri, and cities adjacent to the area the line traverses.

The Fort Scott connection will be made direct with the three 16-inch lines into the Petrolia station, which receives its gas from the southern Kansas and Oklahoma fields.

A.G.A. SPONSORS INDUSTRIAL GAS SALESMEN'S COURSE

Plans are under way for the inauguration of an industrial gas salesmen's course, similar to the one now being conducted by the American Gas Association for domestic gas appliance salesmen. C. W. Berghorn, secretary of the Industrial Gas Section of the Association is setting the machinery in motion for organization of the course, and is making a survey to ascertain the probable number of men who would subscribe to such a course.

STORMS IN ALBERTA CAUSE DAMAGE TO GAS LINES

One of the natural gas mains connecting Calgary, Alberta, with the Turner Valley and a high pressure gas main between the city and the Ogden plant of the Canadian Pacific Railway were both washed away recently by floods. Sufficient gas remained in the holders and remaining pipes to supply most of the domestic consumers in the district during the emergency.

AN OUTSTANDING CONTRIBUTION to GAS HEATING

• SECOND •

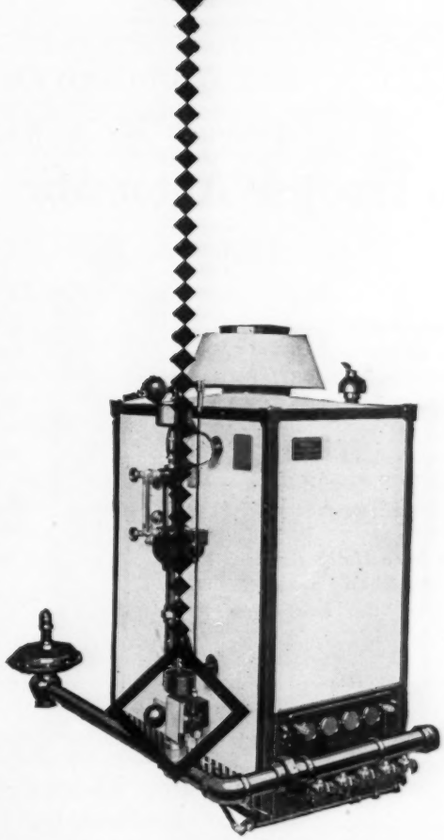
THE THROTTLING VALVE

A PRINCIPLE OF GAS SUPPLY CONTROL . . . . DEVELOPED AND ESTABLISHED BY THE GAS UTILIZATION DEPT. OF THE

AMERICAN RADIATOR COMPANY

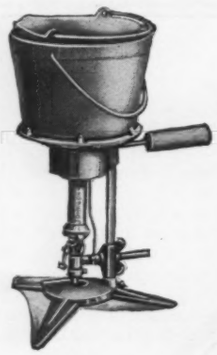
FOUND PERFECTED TO HIGHEST EFFICIENCY ON

IDEAL GAS BOILERS



SEND FOR FULL INFORMATION TO

AMERICAN GAS PRODUCTS CORP.
376 LAFAYETTE STREET . . NEW YORK



Johnson
No. 8 Torch & Melting Pot

Serves three practical purposes!

Here is a three-purpose unit which has won its way into hundreds of shops and laboratories. It will heat soldering coppers, melt soft metals, and the burner may be removed and used as an efficient hand torch. No blower is needed. Write for catalog giving interesting details of this practical, inexpensive unit.

Johnson
No. 18 Automatic Hand Torch

Perfectly balanced for easy handling!

This is one of the handiest torches on the market. Its burner is set at an angle so that perfect balance is attained when grasped by the hand. The pilot light and shut-off valve are controlled by a button within easy reach. Write for details contained in free catalog.

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Pacific Coast Representative: C. B. Babcock Co.,
135 Bluxome Street, San Francisco

IT'S GOING OVER BIG

Because It's a Winner

The Trooper Automatic Water Heater

You can sell it to your customers as low as *$60.00!* (Or without the Automatic Safety Pilot, as low as $55.00.)

Full equipment includes an Automatic Safety Pilot and a Guaranteed Thermostat.

Heater beautifully finished in ivory enamel and proportioned to occupy the least possible space.

Extra heavy Tank made of Copper Alloyed Steel.

Heavy Insulation around Tank. Brass hot and cold water connections.

Equipped with Drain Cock and Dirt Trap.

Write for unprecedented wholesale prices.

Sample Heater shipped on memo charge, if desired.

Troop Water Heater Company

Pittsburgh, Pa.

Southern Office & Warehouse,
2625 Elm St., Dallas, Texas

Branches in all Principal Cities.

West Coast Cooperative Advertising *to* Begin

(Continued from Page 20)

the so-called "Industrial Unit" of the campaign will be judged for its effectiveness by the reactions noted among the trades by the industrial engineers of the various utilities.

And so, the gas industry of the Pacific Coast is being dressed up in new and attractive habiliments and sent forth to court public favor. Groundwork for the campaign has been solidly laid in the pooling of gas company and advertising agency knowledge. Advertising messages and radio talks will do credit to the industry. But no matter how ideal the set-up may be, the final message of the campaign's success will be determined by individual cooperating gas companies. One thing is certain—*Cooperation will put it across.* Not the kind of cooperation that has become a meaningless word in advertisements and sales talks, but the kind of cooperation that means every man in the industry looking to his own activities, to the end that he may individually contribute to the success of the whole program.

Prior to the audition of the first broadcast, on Wednesday, August 14th, the Association in cooperation with the agency will distribute a complete portfolio of the entire advertising plan, including trade paper and radio schedules. Included in the portfolio will be samples of the newspaper advertisements and window display cards and a dummy of the cook book, with full directions as to how they can be purchased, their price and their use.

All of the ammunition is there. The spark of enthusiasm will set it off!

How Gas Companies Must Tie into the Campaign

EIGHT important supplementary activities in which the gas companies must cooperate to assure the success of the Association's campaign have been drawn up by the committee. Every one is vital to the campaign. Here is how the utilities must cooperate:

(1) Hold a meeting or meetings and sell the campaign to their own organizations.

(2) Appoint necessary contact men to call on appliance dealers, display the advertising portfolio and stimulate them to enthusiasm over the objects of the campaign.

(3) Obtain window and counter cards from the Association in sufficient quantities for all offices and windows and those of all the appliance dealers in each company's territory.

(4) Publish newspaper advertisements on the radio page of local papers once a week, Tuesday evening and Wednesday morning. Use the mats and electros which may be secured from the Association, having individual gas company signatures in the place left blank for that purpose.

(5) Increase wherever possible all gas company merchandising and advertising activities during the period of the campaign.

(6) Use the slogan and the standard design embodied in *"Gas, the modern fuel, quick—clean—sure."* Obtain mats and electros of this setup from the Association.

(7) Secure sufficient recipe books imprinted with each local gas company's name to supply all radio inquiries and for future general distribution.

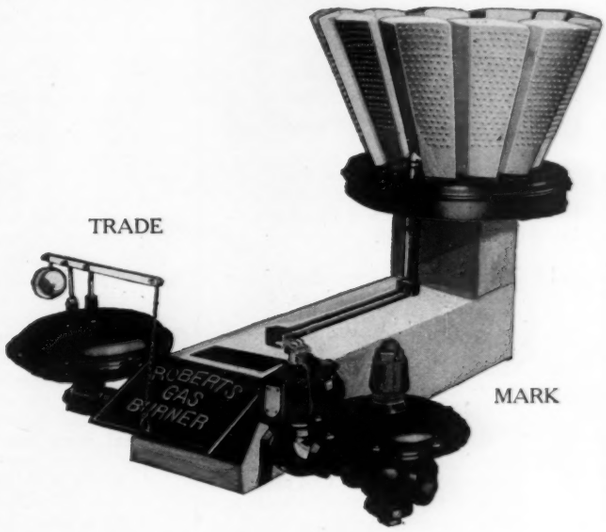
(8) Arrange to obtain reprints of all trade paper advertisements. Send these out with suitable letters to prospects and consumers in each separate industry.

WHEN YOU FIND ALL OF THESE FEATURES

IN ONE APPLIANCE

You Find the Sales Tool You Want

FOR STEAM, VAPOR HOT WATER AND WARM AIR



1st — You want larger and larger sales of gas—PROFIT.

2nd—The right appliance will sell more gas for you and make each **customer satisfied with the amount of each gas bill.**

3rd—The ROBERTS CONTROLLED GAS HEATING UNIT goes several steps farther . . . each user becomes so appreciative of it's many exclusive features that their natural enthusiasm starts the best advertising we know of—WORD OF MOUTH PRAISE.

Write us today for catalog and complete house heating data.

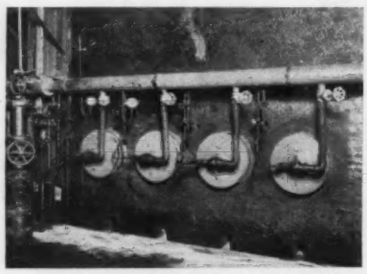
MOST HEAT PER DOLLAR

ROBERTS-GORDON APPLIANCE CORPORATION

CURTISS BUILDING

DELAWARE AVE. AT TUPPER ST. BUFFALO, N. Y.

Forney Combination Gas & Oil Burner for Power Plant and Industrial Use



Forney Burners are used by Central Stations for large boilers and high ratings as shown by the following installations:

(1) Oklahoma Power & Water Company, Sand Springs, Okla. 3 1000 h.p. Sterling boilers, 325% normal rating.

(2) Pacific Gas & Electric Company, San Francisco, Calif., 2 822 h.p. Sterling boilers, 200% normal rating.

(3) American Sugar Refinery Company, Three Oaks, La., 20 566 h.p. B & W boilers, 225% normal rating.

(4) Texas Electric Service Co., Eastland, Texas, 2 1190 h.p. Walsh & Weidner, 335% normal rating.

(5) Texas Gulf Sulphur Company, Boling, Texas, 5 1500 h.p. Sterling boilers, 300% normal rating.

(7) Louisiana Power & Light Company, Sterlington, La., 1 1619 h.p. Walsh & Weidner, 600% normal rating.

(8) Memphis Power & Light Company, Memphis, Tenn., 4 1512 h.p. B & W boilers, 225% normal rating.

(9) Dallas Power & Light Company, Dallas, Texas, 4 1700 h.p. B & W boilers, 300% normal rating. 1 1700 h.p. B & W Boiler, 400% normal rating.

(10) Fort Worth Power & Light Company, Fort Worth, Texas, 3 1700 h.p. B & W boilers, 300% normal rating. 4 686 h.p. B & W boilers, 200% normal rating.

(11) Houston Lighting & Power Company, Houston, Texas, 3 2000 h.p. B & W boilers, 300% normal rating.

Write for literature

Forney Combustion Engineering Company

305 Thomas Bldg., Dallas, Texas

BUREAU STUDYING WATER-GAS AND PRODUCER-GAS REACTIONS

The technical and metallurgical importance of those chemical reactions responsible for the production of water-gas and producer-gas, which are fundamental in all processes involving gaseous and solid carbonaceous fuels, emphasizes the need for data of the highest possible reliability concerning these processes. Two methods of study are possible; the first includes direct determinations of equilibria involving steam, hydrogen, carbon, carbon monoxide, and carbon dioxide, using suitable catalysts; the second consists of indirect calculations from reduction equilibria of certain oxides, especially those of iron, tin, copper, etc. Unfortunately, these independent methods, when compared, show discrepancies of considerable magnitude.

The Pacific Experiment Station of the United States Bureau of Mines, Berkeley, California, has been making a critical study of these discrepancies. Previously reported work in reviewing the specific heat of the gases involved at high temperatures, permits calculations to be made, lessening somewhat these discrepancies, and correlation of existing data has been completed with results which correspond to a 15 per cent error in the chemical equilibria involved. Although the numerical results of this work show a distinct improvement upon previously accepted figures, the chief importance of the values obtained may be to show with considerable definiteness the still existing errors in some of the data, and to specially emphasize the great need for further experimental work leading to a definitive result.

L. A. G. & E. CORP. HOLDS ANNUAL INAUGURAL DINNER

On Tuesday, July 9, the Los Angeles Gas and Electric Company's Employee Association held its annual inaugural dinner and dance at the Shrine Auditorium in Los Angeles, California.

New officers for the coming year were installed during the evening, and are as follows: W. H. Ulm, president; C. R. Marvel, vice president; Arthur Maltitz, treasurer; J. L. LaSpada and E. P. Ramsay, directors at large, and C. E. Bates, Marvel Murray, J. J. McCrory, W. T. Rush, P. A. Chailie, C. H. Zeise and Elmer George, divisional directors.

TWO NEW APPOINTMENTS BY SPRAGUE METER CO.

Sprague Meter Company announces the appointment of Elmer J. Werthman as head of the Davenport, Iowa, office of the company. Mr. Werthman was formerly meter foreman for the Peoples Light Company of the same city.

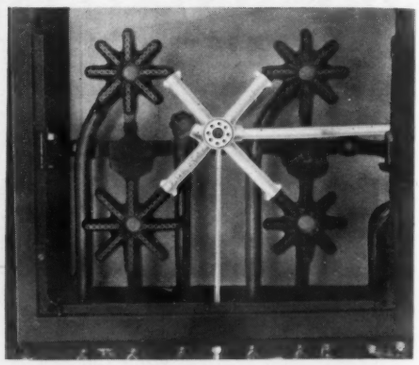
Edward M. Lockwood, Jr., formerly in charge of the Davenport office is now representing the Sprague Meter Company in midwest territory.

W. N. WILKS ASKS FOR SEARCY, ARKANSAS, FRANCHISE

W. N. Wilks, representing the Arkansas Power and Light Company, has asked for a franchise to serve the town of Searcy, Arkansas, with natural gas. It is expected that the fuel will be supplied from the line to be built from Louisiana to St. Louis, Missouri.

BATESVILLE, ARK., GRANTS PERMIT TO GLEN KAHLE

Glen Kahle of Oklahoma recently was granted a natural gas franchise in the town of Batesville, Arkansas. The franchise states that drilling for gas must begin in Independence County within three months.



NEW LIGHTER FOR GAS RANGE IS ROPER FEATURE

As a new development in gas range equipment, a lighter and burner combination as illustrated above, has been added to the Roper line, manufactured by the Geo. D. Roper Corporation, of Rockford, Illinois. As described in a broadside, there is no button to press, the lighter working automatically when the gas cock is turned on. This principle applies not only to top burners but to the simmering burner and oven burner as well.

NEW DISTRICT IN GORMAN, TEX. MAY BE SERVED BY LONE STAR

Construction of the proposed gas pipeline from the Desdemona terminus to the Goss tract in Gorman, Texas, is expected to begin within a short time. A survey is being made by the Lone Star Gas Company, holder of the franchise.

G. R. HINKLE IS NOW AGENT FOR PITTSBURG WATER HEATER CO.

G. R. Hinkle has accepted the post of representative for the Pittsburg Water Heater Company at St. Louis, Missouri. Mr. Hinkle has held the position of commercial manager of the Kansas Electric Power Company of Emporia, Kansas.

INDEPENDENCE, KAN., GETS GAS ON JULY 29

According to a report recently given out by the Missouri-Kansas Pipe Line Company, with headquarters in Kansas City, Missouri, natural gas service was to be started in Independence, Kansas, on July 29.

Pressure Regulators

(Continued from Page 37)

In summary, the following points should be kept in mind for improved pressure control:

The openings to the diaphragm cases should be clean and giving true pressures.

In assembling regulators after cleaning and repairing, care should be taken that the parts are put together in the same relation that they originally had.

The regulators should periodically be given a thorough cleaning, and any binds due to the misalignment of parts should be eliminated.

The regulators should be equipped with the proper diameter of diaphragm for the pressure to be carried.

The regulators should be of a design for the work which they will be called upon to accomplish.

And finally, the size of the valves should be determined by the amount of gas which they are to pass for given inlet and outlet pressures.

TODAY—more than ever APPEARANCE Counts!

THERE'S a very definite demand for beauty of line and color. We see it in kitchen ware—in bath tubs, yes—and in gas water heaters. Welsbach—keeping abreast of the times and having already the most perfect performing gas water heaters on the market, took the natural step as leaders in the industry.

Today the Hotzones with their attractive buff shell and glossy black trimmings are among the most attractive merchandise in any gas showroom.

But behind these pleasing exteriors stands the convincing argument in the phrase, "They're made by Welsbach"—Welsbach, whose lifetime of experience and wide resources made it possible to add the final attraction—*price*. For at present figures, the Hotzone Self-Action Gas Water Heater enables commercial managers to offer their customers the greatest of all values in the water heater field. Welsbach Company, Gloucester City, New Jersey. Sales Offices in Principal Cities.

Member Pacific Gas Association *Member American Gas Association*

Welsbach HOTZONE

SELF-ACTION GAS WATER HEATERS

The Magic Way Company

Gas Heating Devices

including

"Magic Way" Gas Furnaces

"Magic Way" Control Valves and Switches

"Potter" Radiators

"Steel Made" Radiators

"Cole" Floor and Wall Heaters

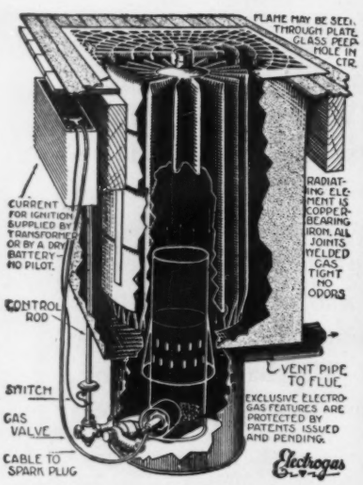
"Hall" Floor Furnaces

Manufactured by

Magic Way Company

National City San Diego California

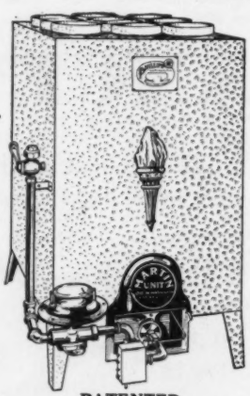
Electrogas


FLAME MAY BE SEEN THROUGH PLATE GLASS PEEP HOLE IN CTR.
CURRENT FOR IGNITION SUPPLIED BY TRANSFORMER OR BY A DRY BATTERY—NO PILOT.
RADIATING ELEMENT IS COPPER-BEARING IRON. ALL JOINTS WELDED GAS TIGHT NO ODORS
CONTROL ROD
VENT PIPE TO FLUE.
SWITCH
GAS VALVE
EXCLUSIVE ELECTRO-GAS FEATURES ARE PROTECTED BY PATENTS ISSUED AND PENDING.
CABLE TO SPARK PLUG
Electrogas

—The Hoover properties at Stanford, as well as the Officers' Quarters, San Francisco Presidio, are heated by these remarkable floor furnaces.

Manufactured in San Francisco

Electrogas



PATENTED

Martin Unit Gas Furnaces

ARE THE RESULT OF 38 YEARS HEATING EXPERIENCE

MADE IN FOUR SIZES

Electric, Thermostat or Manual Control Approved by A. G. A. Laboratory and by the City of Los Angeles

Write for your copy of "Modern Heating Methods"

PHILLIPS HEATING, VENTILATING & MFG. CO.

1710 W. Washington St.
Los Angeles, California

Live Agents Wanted

TESTING LABORATORY A.G.A. APPROVED

100 Per Cent Support *for* This Campaign

(Continued from Page 29)

manager of each group whose division has the highest percentage of quota attainment a suitable award. These accomplishments are rated on installations only.

SALESMEN'S AWARDS

All salesmen's prizes are computed on the point basis. The capacity of the heater sold is taken into consideration in setting the scale of prizes. Each salesman is charged with the responsibility of obtaining 25 points as his individual quota. Any salesman obtaining his quota of 25 will be presented with a genuine cowhide brief case. The first 10 men to obtain a quota of 35 points will receive a Telechron clock. The grand prizes for the campaign for inter-divisional competition are, first prize, a trip to the Pacific Coast Gas Association Convention at Del Monte. The second to sixth prizes are cash, ranging from $50.00 to $15.00.

In an endeavor to create the salesman's interest in the campaign from week to week a bonus of $1.00 per point is paid to each salesman on all points earned in excess of three points per week.

A barnstorming pep tour was inaugurated by A. C. Miller and meetings were held at all divisional headquarters prior to the opening date of the campaign. These pep meetings were attended by all heads of departments, key men, the sales organization and all other employees who could be released from their duties. A number of the larger divisions held their meetings in the evening and gained exceptional attendance. Speakers from the general office were programmed. In addition to outlining the features of the campaign itself a lantern slide talk was presented featuring the uses and advantages of the modern automatic hot water heating system. A great deal of enthusiasm was displayed in a number of the divisions, some of them going so far as to prepare one- and two-act playlets of a comic nature with emphasis on the ridiculous aspects of not having an automatic water heating system.

GOAL—5,000 INSTALLATIONS

Results of the Pacific Gas and Electric Company efforts to date have been highly gratifying. Leading distributors report also that their volume has been materially increased. The success of this selling effort so far is attributed to the early announcement of the company's selling plans and the fact that it is real service they are attempting to sell rather than tanks, valves and other mechanical devices. It is hoped that the combined effort during this intensive selling period will result in excess of 5,000 installations over the Pacific Gas and Electric Company system.

CALGARY, ALBERTA, TO HAVE NEW GAS MAINS

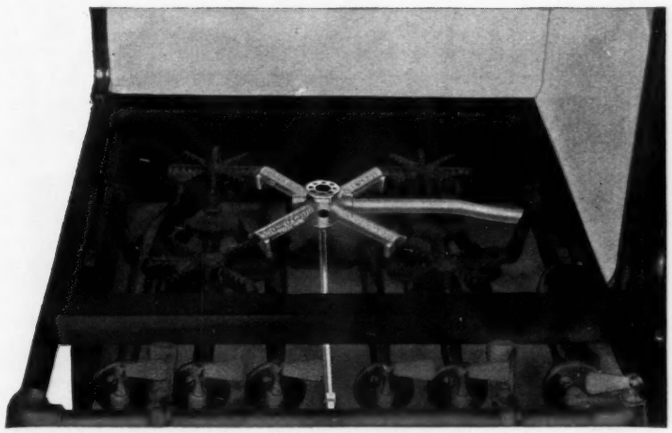
Gas distribution mains are now being laid in Calgary, Alberta, by the Canadian Western Natural Gas, Light, Heat & Power Co., Ltd. Most of the new mains, totaling 35 miles, are in the North Hill section of the city.

REPUBLIC, MISSOURI VOTES ON NATURAL GAS FRANCHISE

Republic, Missouri, recently voted a natural gas franchise to the Empire Gas and Electric Company.

NEW!

At last—a gas range that lights automatically, at the turn of a valve—quick—sure—safe!



ROPER

TRADE MARK

Insta-Flame

TRADE MARK

Automatic burner lighter, when gas cock is turned on.

Positive action, both on and off.

Only gas ignition which lights all burners, top, oven and simmer.

Only constantly burning pilot, for one hand operation.

Burners and other parts removable, same as on any range.

Elimination of possible demand for safety cock and top lighter.

The Roper Insta-Flame is always dependable because there is nothing to get out of order. It makes the gas range easy to operate because each burner is instantly ignited at any gas pressure—no pressing of buttons—no matches—no worry.

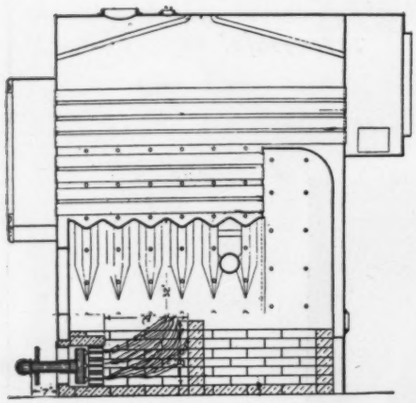
A. G. A. approved.

Prove the "consumer appeal" of this new feature by displaying a Roper equipped with the Insta-Flame on your sales floor.

George D. Roper Corp., Rockford, Ill.

C. B. BABCOCK CO.
135 Bluxome St. San Francisco

WEBSTER RADIANT GAS BURNERS
in the
HEATING FIELD



Webster Radiant Gas Burner installation for Kewanee Boiler Type "C" Corrugated Fire Box.

YOU won't find any trouble selling more load via Webster Radiant Gas Burners for heating boilers!

There's a range of sizes and capacities ready to fit Kewanee, Pacific, Capitol and Ideal Boilers without alterations—with doors and panels fitting those on the boilers exactly.

And with minor alterations —they'll fit any other make of heating boiler. Capacity range from 200 sq. ft. radiation up.

If we can help you—any time—any way—call on us!

WEBSTER ENGINEERING COMPANY
Tulsa, Okla.
DIVISION OF
The Surface Combustion Co. Inc.

Artist's sketch of P. G. and E. garage and shop building

Utility Plans Service Structures *in* San Francisco

A MILLION dollar program in new service buildings is now being planned by the Pacific Gas and Electric Company for San Francisco.

These new buildings will be known as the company's service group and will occupy property recently purchased, consisting of the block bounded by 18th, Shotwell, 19th and Folsom streets.

The program includes the construction of a new two-story reinforced concrete garage and shop building with basement 245 by 255 feet.

It is also planned to remodel the two existing buildings on this property. One of these will be used for warehouse and the other for gas-electric distribution headquarters.

The company's San Francisco meter and transformer shops will be located on this property.

PUBLIC SERVICE CO. OF COLO. HAS NEW BUILDINGS

Public Service Company of Colorado, with headquarters in Denver, announce the opening of the new Frueauff service station and garage in that city. The service building houses the gas service and gas engineering departments and meter shop, as well as like departments for the electric activities of the company. The garage contains repair shops, general shops, machine shops, parts and battery departments, and a storage section for assemblies.

As there are approximately 500 employees working in and from the two buildings, there have been included in the warehouse structure a large assembly hall and first-aid hospital.

COMMERCIAL AND INDUSTRIAL REFERENCE BOOKS READY

The 1929 edition of "Commercial and Industrial Organizations of the United States" is now off the press and ready for distribution. In it are listed more than 13,000 organizations, classified by services and commodities and arranged alphabetically. State and local organizations are listed alphabetically by states.

Copies may be obtained from the Superintendent of Documents, Washington, D. C.

MALTA, MONTANA, WILL HAVE GAS FROM NEW WELL

A natural gas well with an estimated flow of 1,000,000 cubic feet a day was recently brought in near Malta, Montana, by the company drilling for A. H. Perkins, who is under contract to supply natural gas to the Montana-Dakota Utilities Company for a proposed pipeline from Shelby to Glasgow. Franchises have been secured by the gas company in Malta, Saco, Glasgow, Shelby, and other towns along the route.

FORT WORTH GAS CO. NOW HAS EMPLOYEE SAFETY SOCIETY

Employees of the Fort Worth Gas Company recently held a meeting for the purpose of bringing about a company safety organization. A committee was appointed and resolutions adopted to set the machinery of organization into motion, providing for future meetings. Over 150 employees attended the initial session.

1928 ENGINEERING INDEX IS NOW READY TO DISTRIBUTE

The Engineering Index for 1928, published by the American Society of Mechanical Engineers, is now off the press, and ready for distribution. This work is a complete and comprehensive index to periodical technical literature, appearing in 1928 issues of 1700 periodicals. The book is designed especially for technical libraries, and is published in two volumes. This technical bibliography may be obtained from the Societv at 29 West 39th Street, New York, N. Y.

FOUNTAIN, COLO., WANTS GAS FROM AMARILLO-DENVER LINE

Fountain, Colorado, would like to have natural gas service, according to a recent report. A petition is being circulated by citizens, directed to the Interstate Gas Company, now serving Littleton, La Junta and Rocky Ford, asking that the company extend its mains to include Fountain.

PUEBLO HIGH PRESSURE FEEDER LINE IS COMPLETE

Gas will immediately be turned into the new high pressure feeder line to the east side of Pueblo, Colorado, according to a statement by A. M. Talbott, manager of the Pueblo Gas & Fuel Company of that city. The line connects with the present distribution system through an automatic regulator station which was recently completed.

F. J. SCHAFER TO RETURN FROM EUROPE LATE IN AUGUST

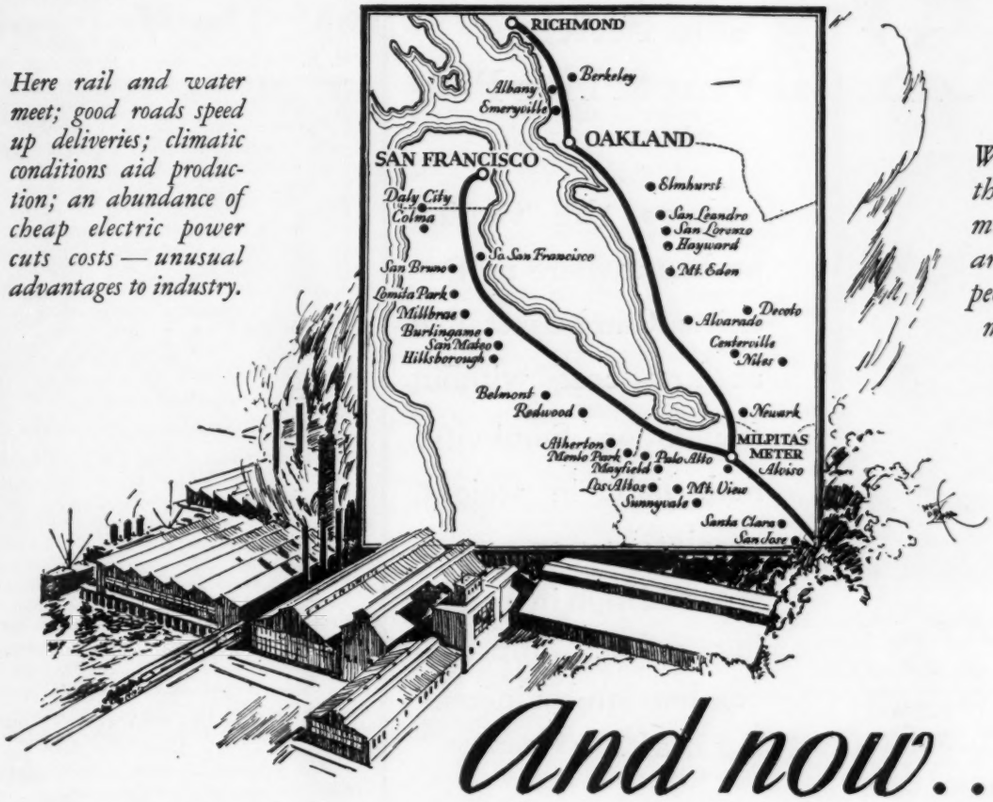
F. J. Schafer, general manager of the Southern California Gas Company, with headquarters in Los Angeles, California, is expected back in his office during the last week in August. Mr. Schafer has been making an extensive European trip, visiting the Gas and Water Exposition in Berlin, Germany, while on the Continent.

TROOP WATER HEATER CO. TO HAVE DALLAS WAREHOUSE

The Troop Water Heater Company has completed arrangements for the locating of a permanent warehouse at Dallas, Texas. William C. Roemhild is in charge of the Texas office of the company with headquarters in Dallas.

INVESTIGATE WHY OTHERS LOCATE HERE

Here rail and water meet; good roads speed up deliveries; climatic conditions aid production; an abundance of cheap electric power cuts costs — unusual advantages to industry.



Within 40 miles of the San Francisco metropolitan bay area live 1,600,000 people—the largest market on the Pacific Coast.

And now.....

a supply of NATURAL GAS *to the San Francisco Bay area*

Natural gas is now available for industries in the San Francisco metropolitan bay area. The supply is available from the Buttonwillow and Kettleman Hills gas fields, said by eminent geologists to be the greatest gas fields in the world, capable of delivering 400,000,000 cubic feet of gas per day for a period of 75 years.

And now the San Francisco metropolitan bay area, in addition to its many other attractive inducements for industrial development, offers this new fuel of over 1100 British Thermal Unit Content at particularly low rates.

This Company will place industrial engineers at your disposal. Facts applied to your specific plant will be presented promptly and confidentially to your executives.

SEND FOR A COPY OF
"OUTSTANDING FEATURES OF THE P. G. AND E."

PACIFIC GAS AND ELECTRIC COMPANY

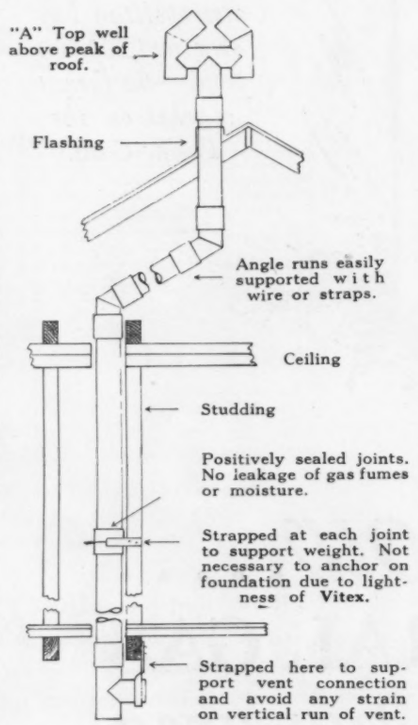
P·G·and E·

Serving 349 communities in Northern and Central California
General Offices 245 Market Street, San Francisco, California

Ind. No. 1

VITEX The Perfect Gas Vent & Flue Pipe

Illustrating Method of Installing Vitex on Concealed Runs.


"A" Top well above peak of roof.
Flashing
Angle runs easily supported with wire or straps.
Ceiling
Studding
Positively sealed joints. No leakage of gas fumes or moisture.
Strapped at each joint to support weight. Not necessary to anchor on foundation due to lightness of Vitex.
Strapped here to support vent connection and avoid any strain on vertical run of vent.

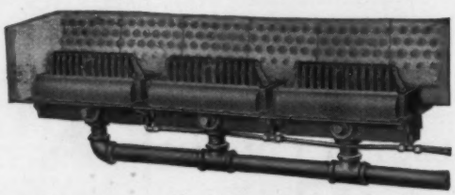
Solves the venting problem where no flue exists. Can be installed at low cost without foundation. Semi-vitrified, light in weight, absolutely non-corrosive and high in insulating value. Improves combustion by increasing draft.

Samples, prices and installation data gladly furnished on request.

PLANT
Rubber & Asbestos Works

537 Brannan Street **San Francisco, California**

R. M. C. Gas Burner



Higher Fire Box temperatures, lower stack temperatures

ROTARY MANUFACTURING CO.

5720 Long Beach Avenue **Los Angeles, California**

WATER HEATER SALES CAMPAIGN HAS NEW INCENTIVE

A new idea for injecting enthusiasm into the "joy campaign" being conducted by the H. R. Basford Company in the sale of Ruud water heaters has been put into practice by George Egleston, in charge of the campaign.

A large board affixed to the wall is covered with some 300 stickers, under which are slips calling for amounts varying from $.25 to $2.50. Every salesman is entitled to one pull for every heater sold. The salesmen save their slips from week to week and at the end of the campaign, if the quota has been reached and all the stickers removed, a drawing is held for the grand prize, which will consist of an article of substantial value, such as a clock, a chest of silverware or similar merchandise.

NORTHWESTERN NATURAL GAS CO. SURVEY NEARLY COMPLETE

Plans for the natural gas pipeline to carry gas to Prosser, Grandview and Sunnyside, Washington, are progressing. The main line is being surveyed, the survey having reached a point north of Prosser, headquarters for operations. Actual construction is expected to begin in August. Franchises have been granted in Pasco, Kennewick, Prosser, Grandview and Sunnyside. The Northwestern Natural Gas Company is holder of the franchise.

OREGON-MONTANA GAS COMPANY IS NEW ORGANIZATION

The Orgeon-Montana Gas Company has filed articles of incorporation in the office of the Secretary of State of Montana, and expected to begin this month. Franchises Montana. Directors named in the articles are: Frank C. Bramwell, Sidnev J. Graham, James O. Stearns, H. F. Forsberg and F. K. Edwards, all from Portland, according to the filing. Capital stock is $100,000, divided into 100,000 shares at $1 each.

$1,124,065.98 SUBSCRIBED BY GAS SERVICE EMPLOYEES

Employees of the Gas Service Company, which has headquarters at Kansas City, Missouri, subscribed for $1,124,065.98 in Cities Service Company securities from January 1 to July 5, 1929.

EVANSTON AND LYMAN, WYO., TO HAVE NATURAL GAS

Evanston and Lyman, Wyoming, among other towns of that state, will be served by distribution lines from the Baxter Basin-Salt Lake City natural gas transmission line. Pipe for the line to Lyman has been delivered, and work is under way.

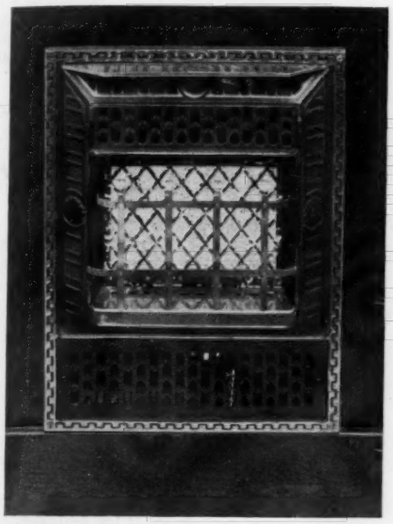
OFFICE CHANGES FOR MERCO NORDSTROM VALVE CO.

Merco Nordstrom Valve Company has opened an office in El Paso, Texas, at 111 South Virginia Street. Announcement is also made of the removal of the Seattle office to the Buyers Building, Portland, Oregon.

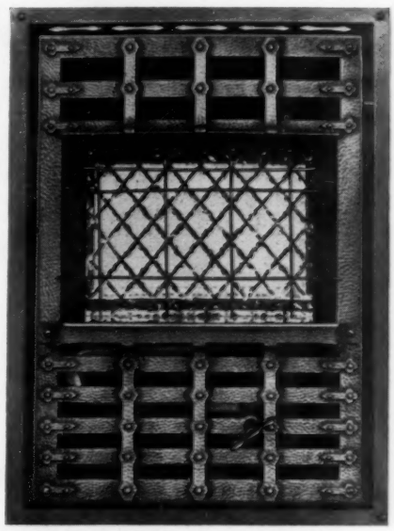
ISMAY, MONT., TO BE SERVED BY MONTANA-DAKOTA POWER CO.

Ismay, Montana, will receive natural gas service before the summer is over, the city council having accepted the proposition given them by Harlan Scott, representative of the Montana-Dakota Power Company.

Now! Wall Heaters with A. G. A. Approval



The latest addition to the "Pacific" line of Gas Heating Equipment are the new Models 7, and 8-A Wall Heaters. These beautiful new Heaters have been thoroughly tested by the laboratory of the American Gas Association, and they now bear the "Blue Star" stamp of approval. They are equipped with the Multi-tubular burner which has proven so popular and efficient in other "Pacific" products. The attractive appearance and sturdy construction coupled with its efficiency in rendering cheerful heat will prove a quick seller and should be displayed on your sales floor.

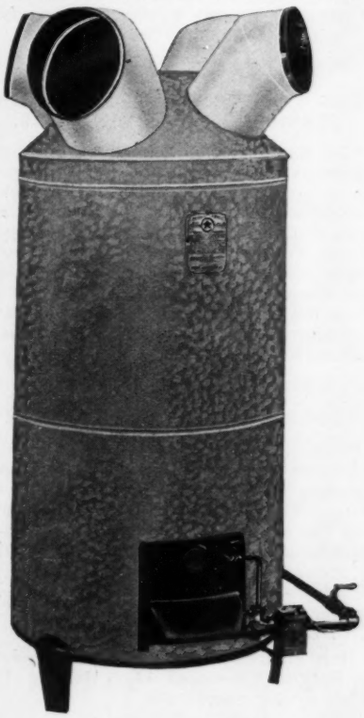


The Multi-Tubular Burner

Each burner has its independent injection of gas. Primary air for combustion is directly siphoned at each individual burner. There is no need for adjusting of the gas and air for combustion, as this new Pacific Burner is scientifically designed to automatically give the correct proportion of air to gas. This results in complete combustion and a high temperature flame of proven economy. No soot. No odors.

By Selling the Complete Pacific Line You Have the Advantage

Because with the complete Pacific line you can offer the correct solution to every heating problem. Where other heating salesmen stress their particular appliance, our agent selects from a full line the appliance best suited. We have a real money making proposition. Write for particulars.

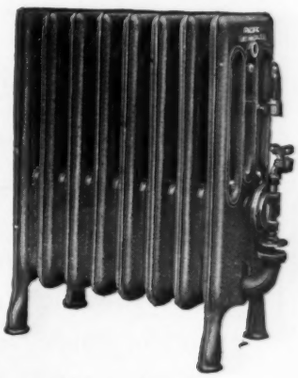


A. G. A. approved Unit Furnace

The Pacific Furnace, with the recognized advantages of the "round" design, eliminates all corners and dead air spaces. It promotes better circulation, giving an abundance of heat more quickly. The heating element is completely welded throughout, is gas tight, and permits no combustion fumes to escape. The heating unit is of 20-gauge pure Ingot Iron metal.

"Pacific" Unvented Gas Steam Radiators

The Pacific Unvented Gas Steam Radiators are now available in four column pattern. A size for every demand, 26, 32, and 38 inches high. The Pacific Gas Steam Radiator has been passed and approved by both the laboratory of the American Gas Association and the Underwriters Laboratories as well.



Our agency proposition is very attractive—write for particulars concerning your locality.

Get in on Every Heating Job in Your Territory

Pacific Gas Radiator

Gas Heating **Company** *Headquarters*

Roseberry and Walter Streets, Huntington Park, California

Manufacturers of Every Type of Gas Heating Appliances

A Heater that Will Deliver a Gallon of Hot Water for Every *1 Foot of Natural Gas.*

THE heater is finished in lustrous enamel.

300-lb. test copper-bearing Steel tank.

New Efficient Insulating Material.

Safety Pilot.

Combination Safety and drain valve.

2 sizes: 25 gal.—40 gal.

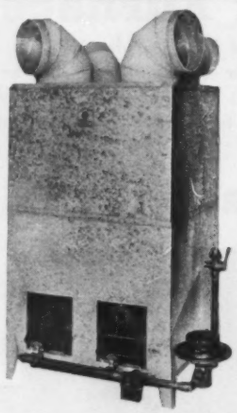
Pittsburg Monarch Automatic Storage Water Heater

Made in 2 Sizes
25 Gallons—40 Gallons

Pittsburg Water Heater Company

Offices at:

478 Sutter St. San Francisco | 2010 Jackson St. Dallas | 242 So. Western Ave. Los Angeles



Furnace Service

How much of your overhead is represented by unnecessary trips to your job?

In other words does your furnace or your service man render your service?

Install **Perfection Multiple Unit Furnaces** and cut down on your overhead.

L. H. Freymuth Jr

311 East Pico St., Los Angeles

In a few days the Pacific Coast Gas Association will be "On the Air," telling the story of Gas, the Modern Fuel, to the housewives of the Pacific Coast. A thoroughly modern mode of approach; a progressive and visioned activity. It bespeaks the united support and enthusiasm of every man and woman in the Gas Industry.

C. B. BABCOCK CO.

San Francisco Los Angeles

AMERICAN METER CO. HOLDS SALES CONFERENCE

The executive and sales personnel of the American Meter Company assembled recently at the Metric Metal Works Division, Erie, Pennsylvania, for a three-day conference devoted to developments in gas measurement and to the consideration of practical methods in sales and engineering service.

Several sessions were devoted to a study of the progress which has resulted from research at the Erie Laboratory in connection with measurement by orifice. Particular attention was given to the integrated orifice measurement in the Linderman meter. Investigations which have been carried on by the company in the field of displacement measurement were also presented. Certain phases of these investigations have been concluded, while others are still in process of development.

NEW COMPRESSOR STATION TO BE BUILT AT STERLING, LA.

The Arkansas-Louisiana Pipe Line Company, a subsidiary of the Arkansas Natural Gas Company, will begin immediately the construction of a compressor station at Sterling, Louisiana, 20 miles from Monroe.

There will be a 10,000 h.p. unit which will be increased to 16,000 h.p as required. The compressor will be in connection with the new 100-mile gas line now under construction from Monroe to Shreveport. It will also be connected with the 16-inch line from Monroe to El Dorado, Ark. M. J. C. Ferguson, vice-president of Republic Construction Company of New York, which has the contract for the project, is supervising preliminary work.

GAS SERVICE CO. GETS 16 NEW PERMITS IN KAN. AND NEB.

The Gas Service Company, an Empire subsidiary, has been granted 16 franchises for the service of natural gas in cities in Kansas and Nebraska, since the middle of June. Following are the cities: Kanopolis, Downs, Glen Elder, Smith Center, Osborne, Beloit, Ellsworth, Mankato, Haviland, Greenburg, Bucklin, Cawker City, Luray and Hiawatha, Kansas, and Superior, Nebraska. A franchise has also been applied for in Horton, Kansas, by the same company.

ROBERTS-GORDON APPLIANCE CORP.—NEW FIRM NAME

Roberts-Gordon Appliance Corporation is the new name of the former Roberts Gas Burner Corporation, following reorganization and refinancing incident to an expanded sales program. M. J. Roberts will continue as president. W. S. Gordon, Jr., is the new vice-president and general manager. Ray Landers will be general sales manager, and J. C. Bowery assistant sales manager.

It is planned to add other gas appliances to Roberts Controlled Gas Heating Units made by the company.

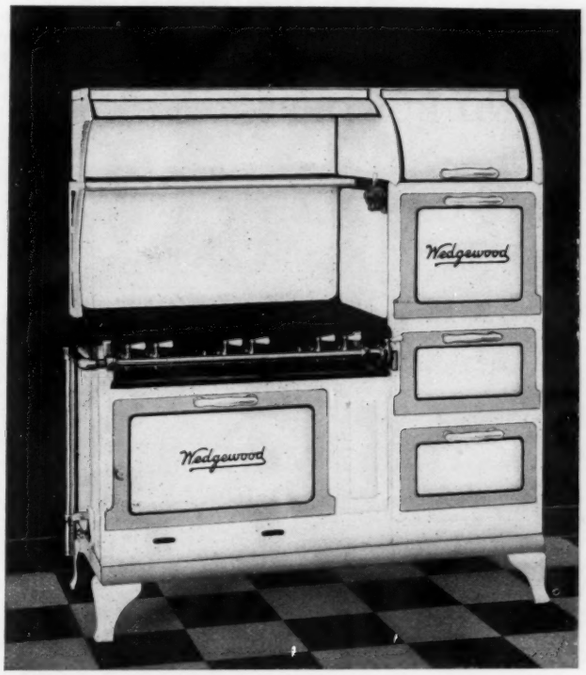
JOHN F. WEEDON NOW ON EUROPEAN TRIP

John F. Weedon, chairman of the advertising committee of the Industrial Gas Section of the American Gas Association, left recently for an eight-weeks' tour of Europe.

Mr. Weedon is superintendent of advertising for the People's Gas Light and Coke Company of Chicago.

Wedgewood

CLOSED TOP



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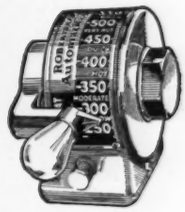
TESTING LABORATORY AGA APPROVED

Tested and approved by American Gas Association



Equipped with Robertshaw Heat Controller

Ivory and Green Enamel

Charming - Durable - A Quick Seller

The above Wedgewood Six-Burner Closed Top Gas Range must be seen to fully appreciate its beauty in the new ivory and green porcelain enamel finish. One very happy purchaser of this range says: "I selected this ivory and green gas range because it will always harmonize with my kitchen, no matter what variations of color may come and go."

There are many different models in the Wedgewood line in this pleasing, easily salable finish. Wedgewood Agents are quite as enthusiastic as we are about them.

KPO KGO
KFI KGW
KHQ KOMO

Listen In!

Every Tuesday, 11:10 A. M., Ann Holden's talks on modern cooking and the use of gas as a clean, economical fuel are growing in interest every week. Tell your customers to listen to these Wedgewood Programs.

Since 1882

JAMES GRAHAM MFG. CO.
LARGEST STOVE MANUFACTURERS IN THE WEST
COMBINATION RANGES COAL AND WOOD RANGES
GAS RANGES
San Francisco Los Angeles Newark, Calif.

Over a Million Satisfied Owners!

The BARTLETT HAYWARD CO.

BALTIMORE *Engineers and Founders* NEW YORK

DESIGNERS AND BUILDERS
– OF –
COMPLETE COAL GAS PLANTS
CARBURETTED WATER GAS PLANTS
BY-PRODUCT PLANTS
DE BROUWER CHARGING AND
DISCHARGING MACHINES
SALT WATER AND FRESH WATER
CONDENSERS
PURIFIERS
SHAVING SCRUBBERS
CENTRIFUGAL VERTICAL TYPE
SCRUBBERS
STEEL TANKS
VERTICAL WASTE HEAT BOILERS

GAS HOLDERS

Reynolds
Gas Control Since 1892

Products for all kinds of Pressure Reduction—for either artificial or natural gas.

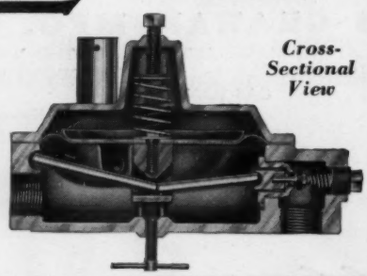
GOVERNORS—Intermediate Pressure, Triple Outlet, Holder, Toggle Type Street.

REGULATORS—High Pressure Service, Low Pressure Service, High Pressure Line, Single and Double District Station.

VALVE—Automatic Quick Closing Anti Vacuum.

Reynolds Gas Regulator Company
Anderson, Indiana

Reynolds Little Giant Regulator



Cross-Sectional View

Analyzing Direct-Mail Technique

(*Continued from Page 34*)

envelopes brought a higher percentage of appreciative comments, but few consumers removed the book from the envelope while the salesman was present. From such personally delivered gifts an average of one live prospect in 10 calls was turned in by the sales force. The third method, most productive of results, produced an average of six live prospects out of 10 calls. By this method the salesman would remove the gift booklet from its envelope, open it to the title page and call the consumer's attention to his (the consumer's) name written with a pen as a part of an appropriate greeting signed by "Walt Dennison," the author. With this as a starter the salesman would turn to any page in the book with its attractive illustration in color and open a conversation on the use of hot water and the unique methods of bathing in various countries. This procedure usually eliminated all sales resistance and led to a friendly and mutually profitable discussion of the consumer's need for some one or more of the modern gas appliances sold by the company.

Newspaper Advertising: Included in the series of newspaper advertisements used to support the campaign were a number of ads which included photographs and statements from such well known moving picture stars as Buster Keaton, Anita Page and Joan Crawford, all of whom spoke of the importance of keeping well and happy through the daily use of warm water. Space for this newspaper series ranged between two column eight inches to four column 12 inches, depending upon the value of the paper as an advertising medium.

Sales of other Appliances: While the campaign was directed primarily at water heater sales, the technique used in delivering the booklets opened up sales for practically every appliance in the line, including refrigerators, space heaters, ranges, etc. These sales, together with a satisfactory increase in the sale of water-heaters, were made with no unusual sales offer such as special discounts, more favorable terms, higher allowance for old appliances, etc. The only gift was the little booklet—produced at an initial cost of approximately 25 cents the copy, and substantially less than that amount for subsequent editions.

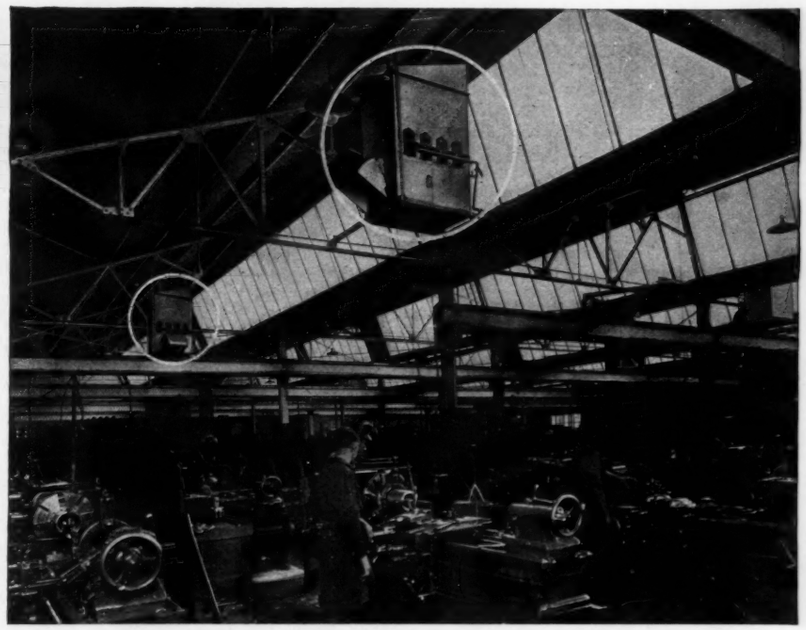
Summing up our experiment so far it might be said that we find it best to include a letter of good-will and a service offer from the manager with an attractive sales proposition on the inside pages of the letter; that such material commands better attention if it be mailed under first class postage; that the gift be of such a nature as will permit of its personal presentation by a representative of the company; and that it be presented in such a way as will permit a friendly discussion as to its merits or interesting features. Friendly contact with the consumer, thus induced, does more than open the way for a possible sale of merchandise—it brings about a better understanding, a closer relationship to and a warmer appreciation of the gas company and its desire to be of real and lasting service to its consumers.

ALBA H. WARREN NOW V.-PRES. OF HOUSTON GAS & FUEL CO.

Alba H. Warren, formerly of Stone & Webster, recently became vice-president and general manager of the Houston Gas & Fuel Company, with headquarters at Houston, Texas.

Overhead Heating...

Now perfected through Payne Overhead Factory Units



View of Payne Overhead Factory Units installed in main machine shop of the Hughes Tool Company, Los Angeles.

SHOPS, factories, garages, auditoriums, commercial lofts and workshops can now be heated comfortably and economically on short notice — without the trouble and expense of an elaborate "central plant" system. Payne Factory Units for overhead Heating furnish abundant fresh, pure warm air on a moment's notice. Used singly or in multiple — each Unit a complete, self-contained heating plant, equipped with electrically driven fan system and individually controlled. Payne Overhead Factory Units take up no floor space, save costly changes and production "tie-ups." Insure comfortable working conditions at lowest possible cost.

Write for Bulletin 17-A, Just Off the Press!

PAYNE FURNACE & SUPPLY CO., INC.

BEVERLY HILLS, CALIFORNIA

Payne Heat

Unit Furnaces
Floor Furnaces
Central Furnaces
Idustrial Installations
Pipeless Wall Units
Factory Units

Payne Engineering Service

Architects, Building Contractors and Heating Engineers are invited to put their troublesome warm air heating problems up to Payne Engineers. Send floor plans and full details of heating requirements. No matter how large or how small your installation may be, the Payne Furnace & Supply Co., Inc., is ready to cooperate with you.

Payne

Northern California Distributors, HOT'N KOLD CORPORATION, *417 Sutter St., San Francisco, Calif.*

THERE IS A "PAYNE HEAT" SYSTEM FOR EVERY BUILDING AND CLIMATE

5-1852

THE BABY DIGGER

The Ideal Modern Way To Dig Gas Trench!

Cleveland Baby Diggers are unequalled for downright usability and trenching satisfaction. Compact — transportable — economical. Tough — fast — dependable. Precision built of finest materials. A wheel type trencher on full crawlers. You'll find Cleveland Trencher pioneering the features that count. Write for particulars.

THE CLEVELAND TRENCHER COMPANY
"Pioneers of the Small Trencher"
20100 St. Clair Ave.
Cleveland, Ohio, U. S. A.
Edward R. Bacon Co., 17th at Folsom Sts.
San Francisco, Cal., Distributor

California Oxide

GAS Purification Requirements can be most efficiently cared for through the additional and improved facilities of our new plant in Southgate.

Both Maas and McKee Oxides have met gas purification requirements of the Pacific Coast over a period of several years and merit your investigation.

California Oxide Co.
308 East Eighth Street
Los Angeles
TRinity 0769

BURT BAY, V.-PRES. AND GEN'L MGR. OF MISSOURI-KANSAS CO.

BURT BAY, formerly with the Empire Gas & Fuel Co., has become vice-president and general manager of the Missouri-Kansas Pipe Line Co., with headquarters in Kansas City, according to announcement by Frank P. Parish, president of the Missouri-Kansas company. Mr. Bay resigned from the general superintendency of the natural gas division of the Empire Gas & Fuel Co. at Bartlesville, Okla., on July 1. His entrance into the business was in 1908 with the Columbus Natural Gas Co.

Burt Bay

Mr. Bay started as a machinist in a compressor station of the Columbus Natural Gas Company in Ohio and was advanced successively to the position of superintendent of compressor stations for that company and the Medina Gas and Fuel Company, which position he held when these and the Berea Pipeline Company were bought by the Doherty interests in 1913. He was in charge of the stations for all these Ohio companies when called to the Empire.

Food Preservation Month Due *in* September

SEPTEMBER, 1929, will be observed as National Food Preservation Month, by industries interested in refrigeration, through a program sponsored by The National Food Preservation Council, the sole purpose of the movement being "to teach the Nation that proper preservation of perishable food is only attained by keeping it in a constant temperature of 50 degrees or less." The specific aims of the movement will be to sell these four major thoughts to the American public:

1. The relationship of health and food spoilage.
2. The necessity for keeping perishable foods below 50 degrees.
3. The causes of food decay and bacteria growth.
4. The vital need for proper all year refrigeration.

The local program will be carried on by local interests whose national bodies have co-operated in the national program.

The American Gas Association, the National Association of Ice Industries, and a score or more other national organizations have joined with the National Electric Light Association, which conceived the idea of a co-operative educational campaign on refrigeration, in this effort.

Through the National Food Preservation Council details of the campaign are being developed. These include national advertising during September in leading national magazines and a National Idea Contest carrying 835 prizes totaling $25,000. Regional councils have been designated to carry out an extensive program of local promotion.

A. G. A. headquarters is urging member companies selling gas refrigeration to tie in with the movement in their window displays, newspaper advertising, etc.

MELLON INTERESTS SHARE UTAH PROJECT; LINE PROGRESS RAPID

CONSTRUCTION work on the natural gas pipeline from Baxter Basin, Wyoming, to Salt Lake City and environs, in Utah, is progressing rapidly.

Important developments in connection with the Wyoming-Utah line include the purchase by the Mellon interests of Pittsburgh, of the holdings of the Producers and Refiners Corporation. Press reports state that the consideration was somewhere in the neighborhood of $5,000,000. Western Public Service Corporation is the holding company for all interests connected with the new line.

The main section of line, 116 miles of 18-inch pipe between Green River, Wyoming, and Coalville, Utah, is practically complete. Franchises are being obtained by the various distributing subsidiaries along the route, and many of the smaller towns in Wyoming and Utah are anticipating the beginning of actual service within a short time. Vernal, Utah, recently granted the Uinta Gas Company a permit to sell natural gas in that town. Evanston, Wyoming, is already planning a celebration in honor of the advent of the new fuel.

Construction activities on the natural gas intermediate high pressure lines in Ogden, is progressing satisfactorily, according to A. W. Schryber, manager of the Ogden Gas Company.

The Wasatch Gas Company has opened offices in Kaysville, Utah, which will be headquarters for the Davis County district. E. L. Linford was appointed district store manager, according to a report received from Jerry Stover, commercial manager for the Utah Gas and Coke Company. Murray, Utah, is in a state of cheerful disorder, with sidewalks and roads torn up and several cement drillers at work digging trenches, making ready for the distribution lines to be laid in that city.

HOME SERVICE COUNSELLOR FOR NATIONAL ASSOCIATION

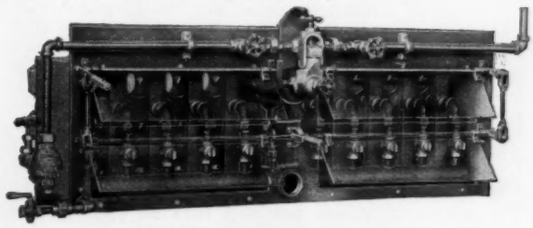
THE appointment of Miss Jessie McQueen as home service counsellor for the American Gas Association has been announced by Alexander Forward, managing director of the Association. Miss McQueen, who has been connected with Montana State College for some years, will join the Association headquarters staff in New York on August 1.

Miss Jessie McQueen

Miss McQueen succeeds Miss A Deane Dowell, who resigned recently. Miss Dowell is Mrs. Robert A. Sovik, of Lynn, Mass., in private life. The new counsellor is a graduate of Albert Lea College, at Albert Lea, Minnesota, and of the College of Agriculture, at St. Paul, Minnesota. She has also received an A.M. degree from Teacher's College, Columbia University, New York, and for the past few years has been foods and nutrition specialist of the Montana Extension Service, Montana State College, Bozeman, Montana.

The Leahy Multi-Jet Unit

Is an investment in fuel saving that you cannot afford to overlook



Patents allowed and pending
View showing Combination Gas and Oil Unit

Designed for Front, Rear and Vertical Firing, Burning Efficiently Low or High Pressure Natural or Manufactured Gas.

Exclusive features that have created exceptional demand for this unit:

1—Designed with no draft loss.
2—High overloads on low gas pressures with minimum draft.
3—Each individual burner receives correct air and gas mixture for maximum efficiency.
4—Auxiliary air opening around tile increases overload capacity of unit with no sacrifice in efficiency.
5—Correct amount of air for combustion can be obtained with minimum opening in stack damper, which retains heat in boiler instead of letting it escape up the stack.
6—Does not require high gas velocities through burner in order to draw sufficient air for combustion.
7—All primary and auxiliary air is admitted through unit and evenly distributed to each burner.
8—Equal distribution of heat full width of firebox.
9—All parts individual and removable.
10—The oil burner can be inserted in the unit or removed instantly.
11—Equal efficiency on gas or oil.

An Efficient, Indestructible, Portable Unit with a Low Initial and Upkeep Cost.

Request literature, data, and installation prints on our

Oil and Gas Burning Equipment

LEAHY MFG. COMPANY

1804-1810 East 8th Street Los Angeles, Calif.
Established 1902

AN AGGRESSIVE SALES POLICY

will include

MOORE'S *Seventeen* PURITAN

"The Heater That Speaks for Itself"

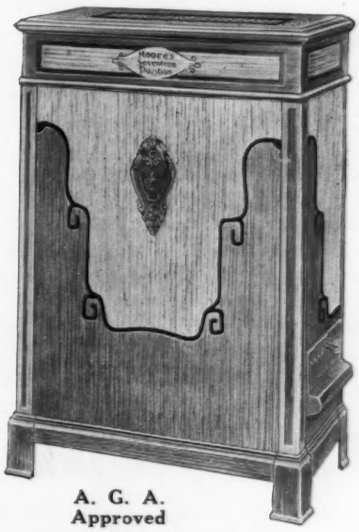
IT MEETS EVERY HEATING REQUIREMENT

THREE SIZES

Normal input ratings:
105,000 B.T.U.'s per hour.
70,000 B.T.U.'s per hour.
35,000 B.T.U.'s per hour.

THREE FINISHES

Two-Tone Walnut } **porcelain**
Mahogany } **enamel**
Velvo-Black



A. G. A. Approved

It takes more than a flame and a casing to make a successful circulating gas fired heater.

MOORE BROTHERS COMPANY, Joliet, Illinois

SINCE 1857

GAS or WATER Connections

whether screw thread or gasket, should be made up with KEY TITE PIPE JOINT COMPOUND.

KEY TITE PIPE JOINT COMPOUND is not a quick hardening cement, but a plastic lubricant and a filler that will seal the most obstinate joint with ease. It covers more surface than an equal volume of red or white lead, thereby reducing the cost. It is waterproof—and there is no waste.

Manufactured by

E. A. Key Co., Inc.

1431 Santa Fe Ave.
Los Angeles, Calif.

Distributors in all principal cities.

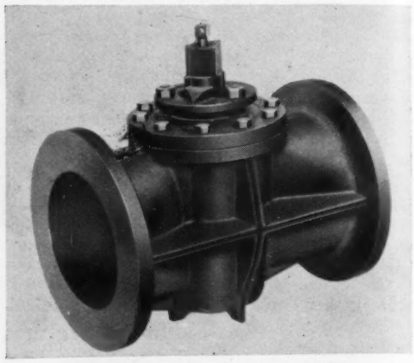
WRITE FOR FREE SAMPLE

New Valve Design Introduced *by* Merco-Nordstrom

THE Merco Nordstrom Valve Company is now on production with what is designated as Venturi Valves, which are of the plug cock type, especially designed for the handling of gas. They represent quite a radical departure in design from the common form of plug cocks and are produced with a view to manufacturing a large size plug cock of high efficiency and moderate cost. It has been found that by making use of the Venturi principle of static head recovery, the larger sizes of plug cocks may be advantageously manufactured with reduced cross section port area and still retain a high efficiency.

In this new line of Nordstrom Venturi Valves, the valves are built with an opening through the plug equal to 40 per cent of the nominal area of the pipe line in which the plug is installed. The interior of these valves is stream-lined so far as practicable, with the result that from 60 per cent to 70 per cent of the pressure-head normally lost over a constriction of this size, is recovered, according to the manufacturer.

A number of advantages are ascribed to the Venturi type as compared to 100 per cent opening plug valves of standard design. Cost is held to be materially reduced because of the resultant economy of metal required to fabricate the valve. The compactness of this type of valve allows it to be installed in places where economy of space is an important factor, such as in governor pits, etc.; also, the lessened weight of the valve makes it more economically and easily handled than the full size standard valve. Thirdly, the Venturi Type Valve is easier to operate because of the smaller area of surface in contact, as well as the smaller area exposed to the line pressure. A tighter valve is achieved because of the small size.



Lastly, less lubricant is required to keep these valves in proper working condition because of the relatively small capacity of the lubricating ducts.

This company has prepared a series of pressure drop charts showing the pressure drops incurred in the various sizes of the Venturi Valves for various fluids and conditions of line flow, particularly for gas under various pressures. These charts are available for engineers who are interested in appraising the merits of this new development in plug cocks.

R. J. DAUGHERTY IS NEW EMPIRE DIRECTOR OF INFORMATION

R. J. Daugherty

R. J. Daugherty, of Bartlesville, Oklahoma, has been appointed director of the information service department of the Empire Companies, succeeding Keith Clevenger, who recently resigned to become director of advertising and publicity for the American Gas Association.

Mr. Daugherty joined the Empire organization in 1926, starting as a salesman in the securities department, and has been steadily advanced by the company.

UNITED CARBON CO. BUILDS CARBON BLACK PLANT

The United Carbon Company has recently completed construction work on a carbon black plant at Rock Creek, Texas. The company plans also to erect two more in the same district later in the year.

NEW HOBBS, N. M., WILL HAVE NATURAL GAS

New Hobbs, New Mexico, will receive natural gas within a short time, pipe for the line having been delivered in Pampa, Texas, the last week in June. N. W. Adams and W. N. Mann hold the franchise in that town.

TIME-O-STAT CONTROLS CO. HAS NEW YORK OFFICE

The Time-O-Stat Controls Company, manufacturer of a complete line of automatic controls, with general offices and factory at Elkhart, Indiana, has recently opened New York sales offices at 11 West Forty-second Street, in the Salmon Tower Building. This office will be the headquarters for all eastern salesmen contacting eastern and Atlantic Coast states manufacturers. An organization of sales engineers and service men will operate from the New York office as well as from the Chicago sales office and will contact, aid and assist manufacturers who are interested in automatic controls.

Carl W. Scholle will be in charge of these offices and will act as contact man throughout the eastern part of the country, representing the new company.

P. G. AND E. TO BUILD LINE TO SALINAS GAS PLANT

Pacific Gas and Electric Company has been granted permission by the California Railroad Commission to construct a natural gas transmission line from a point on its main line near Hollister, California, to the company's manufacturing plant in the city of Salinas, and from there to its gas manufacturing plant in the city of Monterey. The project will cost approximately $500,000.

MADISON, KANSAS, NOW BEING SERVED WITH NATURAL

Natural gas has been turned into the distribution mains of the Western Distributing Company at Madison, Kansas. Ed. S. Miller is superintendent of the company, a Gas Service subsidiary, and his headquarters are at El Dorado.

L. A. G AND E. HAS PHONE ON TOP OF GAS HOLDER

Installation of a telephone in the pent house on top of the Los Angeles Gas and Electric Company's 15,000,000 cu. ft. gas holder was recently completed at Los Angeles, California.

The extension phone has several interesting features. There is a cable which reels and unreels as the piston travels up and down. The length of the cable is 400 feet and is able to go down in the holder a maximum of 330 feet. As far as is known, this is the longest extension phone cable in the Southwest. It would require 800 pounds attached to the end of this cable to break it. However, a safety feature is provided, in that when the tension becomes equivalent to 300 pounds attached to the end, a clutch starts slipping. The contacts of the switch belonging to the phone on the piston are immersed in oil, so there is no chance of a spark being generated.

PAUL McBRIDE NOW MANAGER OF SO. CITIES DISTRIBUTING CO.

Announcement is made by the Arkansas Natural Gas Corporation of the election of Paul F. McBride as general manager of its subsidiary, the Southern Cities Distributing Company, with headquarters at Shreveport, Louisiana. Mr. McBride was formerly manager of the Empire Companies stores department, and was transferred to the Arkansas Natural last year, where he was in charge of the purchasing, warehouse, transportation, and telephone departments of the company. Mr. McBride succeeds Fred C. Armbruster as manager of the Southern Cities company.

OIL EXPOSITION TO BE HELD IN LOS ANGELES MAR. 16, 1930

An Oil Equipment and Engineering Exposition will be held in the Shrine Auditorium at Los Angeles, California, March 16-23, inclusive, 1930. Questionnaires have been sent out to manufacturers and distributors of oil industry equipment, and returns from these indicate a high degree of co-operation, according to E. G. Lenzner, manager.

Scientific exhibits by universities and governmental agencies will be given free exhibit space. Headquarters for the Exposition are being maintained in the Petroleum Securities Building, Los Angeles.

ROPER TO PRINT INSTRUCTION CHART IN SPANISH

Roper ranges, manufactured by the Geo. D. Roper Corporation of Rockford, Illinois, will henceforth be equipped on request, with a cooking chart in Spanish. It is expected that the large number of Spanish-speaking people in the southwest will find the new chart an added convenience.

SO. COUNTIES GAS CO. ACTS AS HOST TO CALIF. BUILDERS

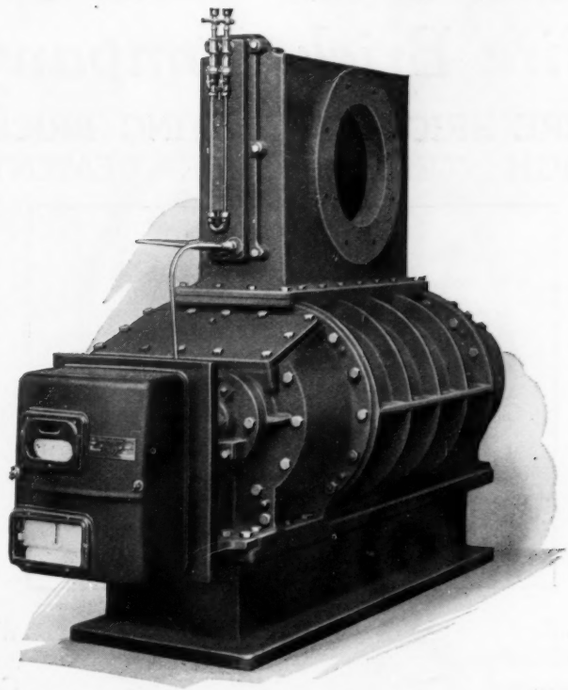
Visiting delegates of the California State Builders' Exchange, meeting in quarterly session in Santa Barbara, California, on June 29, were entertained at luncheon on that date by the Southern Counties Gas Company in the auditorium of the company. Luncheon was served to about 300 guests.

TWO ARIZONA TOWNS NOW SCHEDULED FOR GAS

Claypool and Lower Miami, Arizona, will receive gas service in about 60 days, according to a recent report. The Arizona Edison Company is now laying mains for the new service.

Modern Connersville Equipment

increases gas distributing efficiencies



The "RA" Demand Recorder

To accurately record the gas demand during definite time intervals, or to show the maximum requirement of a large consumer, Connersville Meters may be equipped with the Connersville "RA" Demand Recorder.

Built with precision from sturdy parts, the "RA" Demand Recorder is in keeping with the sturdy accurate construction of Connersville Meters, which assures dependable accuracy of gas measurement. Fitted with 35 day charts and suitable motors to drive the charts, these recorders require attention only at the longer intervals—a characteristic that is in keeping with the service of Connersville Meters on many installations.

The "RA" Recorder is just another of the developments which the engineers of The Connersville Blower Company have made for the more dependably accurate measurement of gas in manufactured gas plants, or natural gas lines, on distribution lines and large consumer installations.

If you are not already getting the benefit of these developments, send for Bulletin 4D and information about equipment for your requirements.

The Connersville Blower Company

Michigan Ave. at 16th St.
Connersville, Indiana

CONNERSVILLE

Blowers-Gas Pumps-Meters-Cycloidal Pumps

Stockton Fire Brick Company

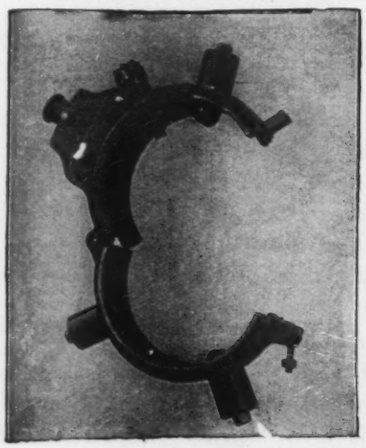
FIRE BRICK, INSULATING BRICK
HIGH TEMPERATURE CEMENT

High Grade Refractories
for

GENERATOR LININGS
CHECKERS
BOILER SETTINGS

OFFICE:
Russ Building,
San Francisco

WORKS:
Stockton,
California



The STRICKLER
Ratchet Pipe Cutter

The STRICKLER Ratchet Pipe Cutter automatically cuts cast iron, steel and wrought iron pipe (from 1½ to 30" in diameter) by hand (either in the trench or in the shop).

You can cut any pipe from any position easily. Simply pump the handle and the STRICKLER does the rest. Order your STRICKLER Now

W. W. STRICKLER & BROS.
1475 Oak Street Columbus, Ohio

SOUTH CHESTER STEEL PIPE

Excels for Gas Service

The unusual care given to accuracy of diameter and welding qualities, makes Chester Pipe a favorite for gas lines.

SOUTH CHESTER TUBE CO.
Chester, Pa.

ACCURACY IN DETERMINING GASOLINE CONTENT

The Bureau of Standards has developed a new precise method for determining the amount of gasoline present in an untreated natural gas and the amount remaining in the treated gas. This method employs an isothermal distillation of the natural gas mixture and a system of recombination of various fractions, with measurements of their saturation pressures. It is accurate to within 10 gallons of condensate per million cubic feet of gas. In order to attain this accuracy with the small gas samples used it was necessary to measure a volume of gasoline as small as three ten-millionths of a gallon and to employ temperatures as low as 347° below zero (Fahrenheit).

HOT-N-KOLD CORP. TO CLOSE RETAIL STORES

The Hot-N-Kold Corporation of California, which has been acting as distributor for a number of gas and electric appliance lines, has recently announced the discontinuance of its retail stores. According to C. H. Dickey, Jr., president of the organization, the wholesale business has grown to such importance that it has been found advisable to sell the retail stores that have been operating in various northern California cities.

NORTHWEST CITIES GAS CO. BUYS PLANT AT NORTH BEND

Northwest Cities Gas Company has recently purchased the gas plant serving North Bend, Eugene and Marshfield, Oregon, from the Mountain States Power Company. The plant is situated at North Bend, and serves the other two cities. The franchise was granted to the Mountain States Power Company in 1907, and has been operated by that company ever since.

Under the new owners the system probably will be operated under the local name of the Coos Bay Gas Company.

ARROWSMITH TO REPRESENT MAXON PREMIX BURNER CO.

The T. G. Arrowsmith Co., Pacific Coast Manufacturers' representatives with headquarters in San Francisco, has recently accepted representation for the Maxon Premix Burner Co. of Muncie, Indiana. This company manufactures complete conversion units and a full line of industrial gas burning equipment.

C. L. CARR IS NOW SUPT. OF ST. JOSEPH GAS CO.

C. L. Carr, who for a number of years has been superintendent of the Capital Gas and Electric Company at Topeka, Kansas, has been transferred to the St. Joseph Gas Company of St. Joseph, Missouri, as superintendent.

H. H. Harrington, who has been in charge of the St. Joseph Gas Company, is transferred to Monett, Missouri, where he has been placed in charge of the construction of the gas distribution system in that city, and others in the district.

PAUL CLAY IS DISTRICT MGR. OF TEXARKANA DIVISION

Paul Clay, district manager of the Arkansas Natural Gas Corporation at Pine Bluff, Arkansas, has been appointed district manager of the Texarkana division of the Cities Service Company.

F. D. Shanks of El Dorado, Kansas, will take the position formerly held by Mr. Clay at Pine Bluff.

FISHER GOVERNOR COMPANY BUYS APEX REGULATOR

The Fisher Governor Company of Marshalltown, Iowa, has announced purchase of the Apex Regulator Company of Decatur, Illinois.

The Apex products are closely allied with those of the purchasing company, which manufactures automatic pressure control specialties for steam, water, air, and the oil and gas industries. However, the Apex line has, previous to this time, consisted of smaller valves for less diversified fields, and it is planned to continue to specialize on smaller valves for plumbing, refrigerating machines, oil burners, and similar equipment. The specialties of these industries and others will be expanded so that a complete line of control devices will be offered.

A. W. Cash, inventor and founder of the Apex Company, has contracted to act as engineer and have general supervision of the new plant.

All of the plant equipment of the Apex Company will be moved to Marshalltown. The Fisher Governor Company will operate the Apex Regulator Company as an entirely separate unit, but its products will be handled by Fisher representatives.

NATURAL GAS SERVICE NOW ESTABLISHED AT WOODWARD

Natural gas service has been established at Woodward, Oklahoma, by the Winchester Oil and Gas Company, through a pipe line from the Barber County field near Harper, Kansas. A total of 110,880 feet of gas mains have been laid by the company in Woodward. Service has been started by the company also at Mooreland, Alva and Waynoka. The Barber County field, which is the source of supply for those towns, is said to be producing 110,000,000 cubic feet of gas per day.

OKLAHOMA NATURAL HOLDS PICNIC JULY 13

Oklahoma Natural Gas Corporation held a picnic at Iola, Kansas, on July 13, attended by more than 100 employees of the company.

Announcement was made of the safety trophy to be given this year by R. W. Hendee, vice-president of the company, to the district with the best record for decrease in lost-time accidents.

SALEM GAS PLANT BOUGHT BY PORTLAND GAS & COKE CO.

Announcement of the sale of the Salem gas plant of the Portland Electric Power Company of Portland, Oregon, to the Portland Gas & Coke Company, was recently made by Franklin T. Griffith, president of the power company. The change in ownership was scheduled to take place August 1.

OTTUMWA, IOWA, NOW HAS HOME SERVICE DEPT.

The Ottumwa Gas Company of Ottumwa, Iowa, recently opened a Home Service Department. A portion of the basement, formerly used as a store room, is now being used for an auditorium and model kitchen. Mrs. Beulah Hayten is supervising the new department.

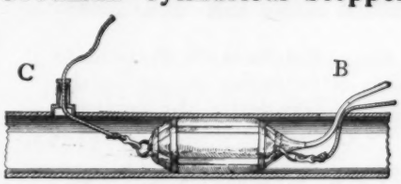
LONE STAR COMPLETES LINE FROM DENISON FIELD

The Lone Star Gas Company, with headquarters in Dallas, Texas, in June, finished a trunk line from the Denison gas field, and is now supplying gas to parts of east and north Texas, and to Oklahoma.

Pipe Stoppers

2" TO 48"

Goodman Cylindrical Stopper



For Any Pipe—
Intermediate Pressures

DEPENDABLE GAS MAIN BAGS—THREE TYPES

Type A—Seamless, reinforced tube. N
Type B—Reinforced seams, for heavy duty.
Type C—Canvas-covered, for use where plain rubber will not last. TREATED
FOR USE IN OIL LINES while welding is being done.

Safety Gas Main Stopper Company
523 Atlantic Avenue, Brooklyn, N. Y.
Cable Address: Gastopper, N. Y.
Pacific Coast Representative: C. B. Babcock Co., San Francisco, California

Fire Brick Contractors

Established 1906

J. T. Thorpe & Son

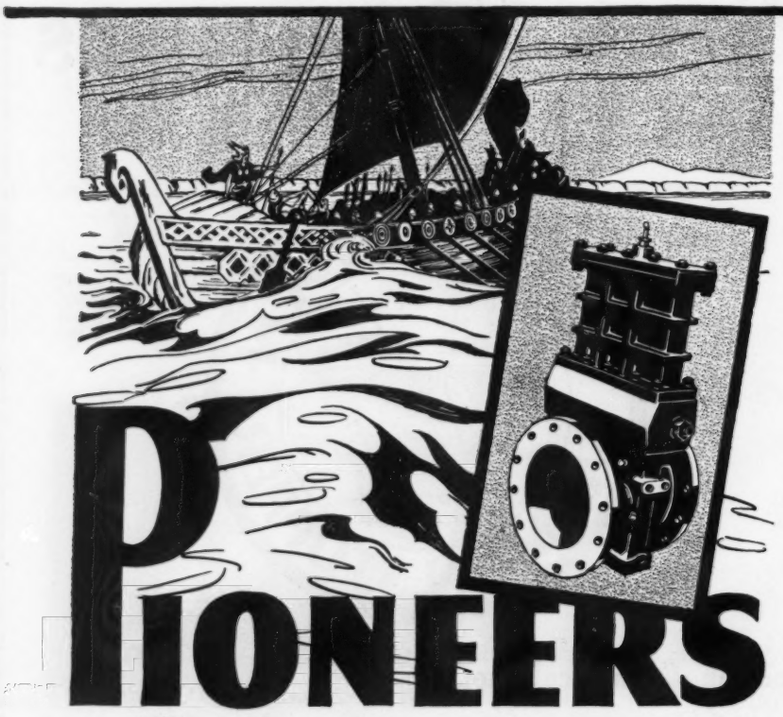
Inc.

Specializing in Gas Generator, Boiler, Still and Furnace Brick, Industrial Furnaces, Retorts, Kilns, Brick Smokestacks.

A capable Engineering Department competent to advise on any problem involving firebrick construction.

San Francisco	Seattle	Portland	Los Angeles
417 Market St.	305 White Bldg.	609 Ry. Exch. Bldg.	321 W. 3rd St.

OVER 8500 IN USE



PIONEERS

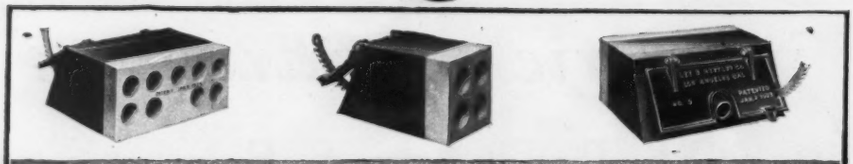
In every field there's a pioneer. Anson Robinson was the pioneer in the development and perfection of an orifice device for the measurement of gas, air, water or oil. This device, the Robinson Orifice Fitting, is broadly protected by U. S. Patent No. 1569305.

ROBINSON ORIFICE FITTING CO.
1435 SANTA FE AVENUE, LOS ANGELES, CALIF.

Distributors
The Foxboro Company . . Westcott & Greis, Inc.

English Distributor
Walker, Crosweller and Company
54-58 Queen Elizabeth Street, London, S. E. 1

ROBINSON ORIFICE FITTING



Mettler Entrained Combustion Gas Burners
FOR ALL Purposes
Kinds of gas
Pressures
406 S. Main St. LEE B. METTLER. CO. Los Angeles Cal.

P. G. AND E. CO. SHOWS MOTION PICTURE OF NEW LINE WORK

A short individual film showing moving pictures of the various phases of activity in bringing natural gas into San Francisco has been prepared by the Pacific Gas & Electric Company. The picture was shown Friday, July 12, to a large number of employees in the general offices at 245 Market Street. E. M. Seel, special representative of the publicity department of this company, was in charge of the film and delivered a short address on the various phases of this new development.

B. W. MUELLER TAKES OVER NEW TERRITORY

B. W. Mueller, manufacturer's representative of San Francisco, has taken over additional territory in the interests of the Inertol Company of New York. Mr. Mueller handles the product "Imunol," a protective compound for the inside and outside of gas holders. Heretofore, he has sold this product only on the Pacific Coast, but under the new arrangements, will have complete charge of all the territory west of Denver.

MR. AND MRS. E. M. DE REMER ON TRIP TO HAWAII

Mr. and Mrs. E. M. De Remer of Los Angeles, sailed July 27 on the City of Honolulu for a three weeks visit to the Hawaiian Islands. Mr. De Remer is industrial engineer for the Southern California Gas Company, with headquarters in Los Angeles.

SURFACE COMBUSTION COMPANY OPENS KANSAS CITY OFFICE

The Surface Combustion Company of Toledo, Ohio, announces the opening of district sales offices at Kansas City, Missouri. W. H. Kay will have charge of the branch. The territory to be covered is Kansas, Nebraska, Wyoming, Colorado, Utah, Missouri, and parts of Texas.

RALPH WALTHAM ENTERS NEW FIELD OF ACTIVITY

Ralph Waltham, assistant engineer in the gas and electric division of the Engineering Department of the California Railroad Commission for the past seven years, has resigned his position to become managing editor of "Electric Light and Power," a trade journal published in Chicago. He will assume his duties some time during the first of August.

DANIEL J. YOUNG RESIGNS POST WITH TACOMA GAS & FUEL

Daniel J. Young, formerly consulting engineer for Byllesby Engineering and Management Corporation, has resigned to accept a position with the Tacoma branch of the Bank of California. Mr. Young was at one time assistant general superintendent of the San Diego Consolidated Gas and Electric Company, of San Diego, California.

SO. OREGON GAS CORP. EMPLOYEES HOLD ANNUAL PICNIC

Employees of the Southern Oregon Gas Corporation held their annual picnic at Riverside Park, Grants Pass, on Sunday, July 28. Employees from plants in Grants Pass, Roseburg, Medford and Ashland, attended the event.

FOSHAY TOWER DEDICATION TO BE HELD AUG. 30-SEPT. 1

Formal dedication of the Foshay Tower will be held on August 30 and 31, and September 1, according to an announcement made by Wilbur B. Foshay, president of the W. B. Foshay Company of Minneapolis. The program for the occasion is now being formulated, and will be in the nature of a Washington Memorial. On the initial evening a spectacular fireworks display will be set off from the Tower. Saturday, August 31, has been set aside for the dedication, with patriotic and veterans societies of Minneapolis participating in the program.

Governors of the States are being invited to attend and participate in the services. The Governor of Alaska, premiers of the provinces of Canada and presidents of the two Central American republics in which the Foshay company operates, Honduras and Nicaragua, and the President of Mexico, are also being extended invitations to attend.

ST. LOUIS, MO., GAS HOLDER FOUNDATION BEING LAID

Construction is progressing on the 10,000,000 cubic foot gas holder of the Laclede Gas Light Company in St. Louis, Missouri, according to H. C. Wehnert, chief engineer of the company. The foundation is about half completed, after which steel erection will begin. The work is being done by the Management and Engineering Corporation of Chicago, a subsidiary of the Utilities Power and Light Corporation.

W. M. SHEPARD TO GO TO BUENOS AIRES

W. M. Shepard, vice-president and general manager of the California Oregon Power Company, with headquarters at Medford, Oregon, has left the company to take a position with the American and Foreign Power Corporation, and will be stationed at Buenos Aires, Argentine Republic. Mr. Shepard has been with the California Oregon Power Company about 13 years.

JUDSON P. QUINTARD IS NOW TRAVELING FOR ALCAZAR

Judson P. Quintard, formerly manager of the stove department of the John Bruener Co., San Francisco, has recently gone on the road for the Alcazar Range & Heater Co. Working out of the San Francisco office, he will cover the entire Northern California territory. For the present he has confined his activities almost entirely to introducing the new No. 2000 Alcazar, the latest addition to the company's line.

A. G. A. RESERVES EXHIBIT SPACE IN INTERNATIONAL EXPOSITION

The American Gas Association has reserved a section of space in the International Heating and Ventilating Exposition, to be held in Philadelphia, during the week of January 27, 1930. This reserved space will be used by manufacturing company members of the A. G. A., and will give opportunity for presenting a graphic picture of the progress which gas heating equipment has made.

DUPLICATE PIPELINE TO SERVE EDMONTON, CANADA

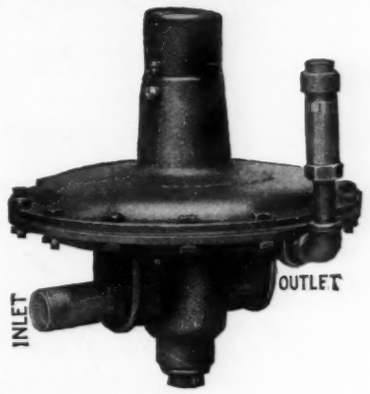
Contracts for the laying of the first section of a duplicate pipeline between the Viking gas field and Edmonton, Canada, have been let by the Northwestern Utilities Ltd. to the firm of W. A. Forman, Ltd. It is estimated that the work will cost approximately $317,000.

FULTON

CF

House-Service Regulator

EQUIPPED with a highly efficient spring valve which automatically reduces intake pressures to any desired degree. It is strongly recommended by its valve seat feature which our catalogue fully explains. Send for your copy today.



The Chaplin-Fulton Mfg. Co.

Organized 1884—Oldest Builders of Gas Regulators in the Country. Built in all Sizes, From 1 Inch to 24 Inches; For All Service. 1 oz up to 2000 lbs. Pressure to Square Inch.

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***THE* Protective Paint for Water Seal Gas Holders**

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B. W. Mueller—447 Sutter St.—San Francisco

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Sprague Semi-Chrome Leather

Resists Acids
and Boiling Water

Now Used in All

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After

Five Years' Tests and Experiments

May we send you samples and data

The Sprague Meter Co.

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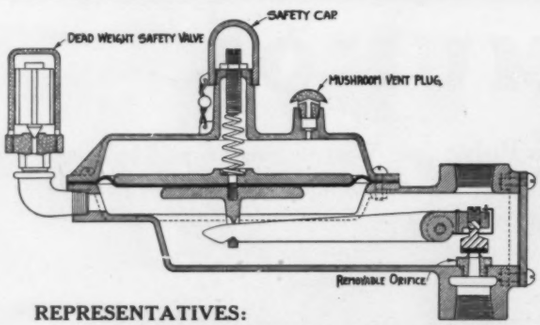


PRESSURE REGULATION FOR ALL REQUIREMENTS

REPRESENTATIVES:
Seidenglanz & Co., Santa Fe Building, Dallas.
Midland Supply Co., Dwight Building, Kansas City.

GROBLE GAS REGULATOR COMPANY, Anderson, Ind.

GAS LINE FROM DENVER TO FORT COLLINS PROGRESSING

At present the Public Service Company is spending more than $1,500,000 on the main from Denver to Fort Collins, which will serve northern Colorado communities. This line is expected to be completed in October and ready to furnish service to customers by winter. In addition to Fort Collins the gas line will serve Longmont, Loveland, Boulder, Greeley and Golden.

From the Denver main, extensions have been built to Englewood and Littleton.

In Southern Colorado, the report shows, Rocky Ford, La Junta, and the beet factory at Swink have been connected to the main line at an expenditure of more than $250,000. Las Animas is negotiating for gas at the present time.

The company is also building a $500,000 booster station at Model, near Pueblo, which will furnish a higher pressure for the additional number of customers who will draw gas from the line when northern Colorado services are connected. This work is nearing completion and will be ready for the winter load.

COAST COUNTIES TO EXERCISE NEW FRANCHISE RIGHTS

Coast Counties Gas and Electric Company with headquarters in Santa Cruz, California, has received permission from the State Railroad Commission to exercise its franchise rights for the construction of an extension of the natural gas transmission line now being installed by the Pacific Gas and Electric Company through San Benito County, and to construct a gas distribution system in the town of San Juan. A similar permit has been granted in Santa Clara County for the service of natural gas to Gilroy and Morgan Hill.

LONE STAR CO. AND SUBSIDIARY REPORT FEWER ACCIDENTS

According to a report submitted by A. W. Breeland, safety officer for the Lone Star and Community Natural Gas Companies, with headquarters in Dallas, Texas, accidents on their systems decreased from 73 in January to nine in May, the Lone Star's January total being 53, and the May total for the company being eight. The Community Natural reported 20 in January as compared with one in May.

U. G. I. GETS CONTRACT FOR IOWA UTILITY

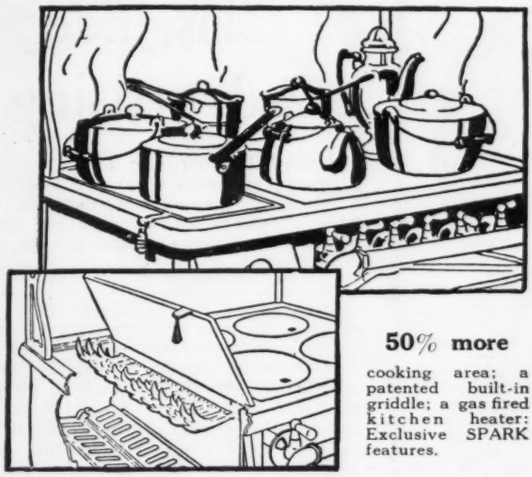
The Iowa Railway and Light Corporation of Marshalltown, Iowa, has contracted with the U. G. I. Contracting Company division of United Engineers & Constructors, Inc., of Philadelphia, for a Cottrell electrical tar precipitation plant, having a capacity of approximately 1,600,000 cu. ft. of gas per day.

WESTERN GAS CO. BUILDING LINE TO KINSLEY, KAN.

Natural gas will be served in Kinsley, Kansas, shortly, according to F. A. Lanahan, secretary of the Western Gas Company, holder of the franchise in that city. The main line will be 6⅝ inches in diameter.

FOREMOST, ALBERTA, MAY SOON RECEIVE NATURAL GAS

The Canadian Western Natural Gas, Light, Heat & Power Company of Calgary, Alberta, expects to supply gas to Foremost, Alberta, from a gas field south of the town. Construction is hoped to be complete early in 1930.



50% more

cooking area; a patented built-in griddle; a gas fired kitchen heater: Exclusive SPARK features.

The construction of the Spark Griddle Top stove encourages the use of gas in the kitchen heater. A special patented gas burner is placed in the firebox. It distributes the heat evenly, but does not interfere with the burning of coal, wood or trash in the heater.

$1000 a Day

Will heat Portland's Kitchens with Gas

Portland is only mentioned as an example. Any other city with 90,000 domestic meters has a potential kitchen heater load of 405,000,000 cu. ft. annually. That represents a 30 ft. per hour burner in use half an hour a day, 300 days a year. Figure this load at your own domestic rate. Isn't it worth cultivating?

The Hammer-Bray Company

SPARK Griddle-top GAS STOVE

Every Spark stove has the A.G.A. seal of approval.

Oakland California

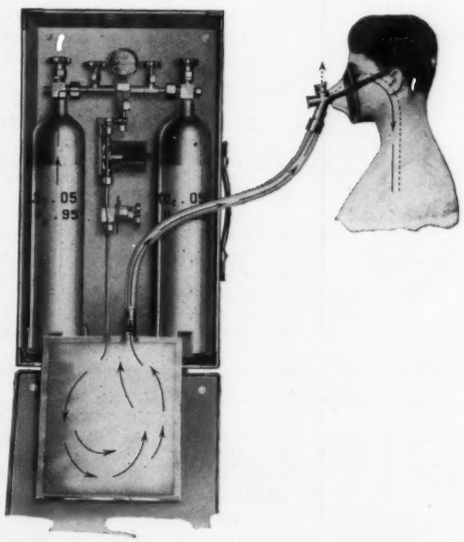


Illustration shows the flow of Carbogen from the time it leaves the cylinder until it is finally exhaled by the patient.

Write for Bulletin No. 80
PACIFIC COAST BRANCH
318 East Third St., Los Angeles, Cal.

Public Service Today Requires the Use of H-H Inhalators

The H-H Inhalator is a Resuscitation Device for administering Carbogen (95% of Oxygen and 5% Carbon Dioxide) to victims of Asphyxia from Carbon Monoxide, Gas, Smoke, Fumes and other causes.

Inhalators are being used successfully by many gas companies to create good will among customers as well as employees.

When respiration has stopped, artificial respiration by the manual prone pressure method should be employed to start spontaneous breathing. This effort should be assisted by administering Carbogen simultaneously from the H-H Inhalator.

The H-H Inhalator is a wise, good-will investment.

It is approved by the American Gas Association.

Mine Safety Appliances Co.

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EMPIRE
Oil Meters

Positive Displacement Oscillating Piston Type

Simple in Construction—Easy to Operate—Low in Cost of Maintenance

EMPIRE meters are highly accurate, and **stay** accurate. They are invaluable for cracking and absorption processes; for gas companies; for refiners and distributors of gasoline and all distillates of petroleum; for measurement of crude oil, cold or hot.

ALL SIZES ⅝" TO 6"

Standard meters will withstand working pressures of 150 lbs. to the square inch. High pressure types will handle 300 lbs. Higher pressures and special types to order.

National Meter Company

299 Broadway, New York

1048 Folsom Street, San Francisco **645 Santa Fe Avenue, Los Angeles**

A FAIR QUESTION
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Do You Always Get the

Fire Brick

Best Suited to the Requirements of

Your Particular Plant?

Fire Brick that will give you the lowest per year or per ton cost?

Manufacturing a complete line of refractories is our business. It is also our business to help you select the refractory best adapted to your special needs. You are invited to avail yourself of this service whenever you are in the market for refractories.

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Classified Advertising

Classified advertising five cents per word; minimum $2.00 per insertion. Situation Wanted advertisements up to 50 words will be published three consecutive issues without charge.

HELP WANTED—MALE

Gas utility operating in Southern California desires services of engineer for research and development work on the industrial utilization of gas. Man with thorough training in mechanical or chemical engineering, with previous experience in the gas industry will be given preference. State details concerning age, training, salary, etc. Address C-17, care of *Western Gas,* 124 W. 4th Street, Los Angeles, California.

SITUATION WANTED—MALE

Manager of inter-mountain gas company with 2,000 meters desires to make change. House-heating engineer with experience as manufacturers' representative desires new position. Applicant is 34 years old, college trained, and is producing good results in present work. Can give best of references from present and past employers. Fourteen years experience. Address A-77, care of *Western Gas,* 124 West 4th Street, Los Angeles, California.

Civil Engineer, 30 years of age, with eight years experience in gas transmission and distribution line work, also land and lease work, desires connection with pipeline construction company, valuation company, or gas company. Good references. Address B-92, care of *Western Gas,* 124 West 4th Street, Los Angeles, California.

CITIES SERVICE GAS CO. PLANS TWO REPLACEMENTS

Cities Service Gas Company has completed plans for the replacement of the 16-inch pipeline from Ottawa to Lawrence, Kansas, a distance of 18 miles, with an 18-inch line. The new line will take a slightly different route from the old one, but will serve the same territory. The company also plans to replace 15 miles of 12-inch line extending toward Topeka, with a 16-inch line.

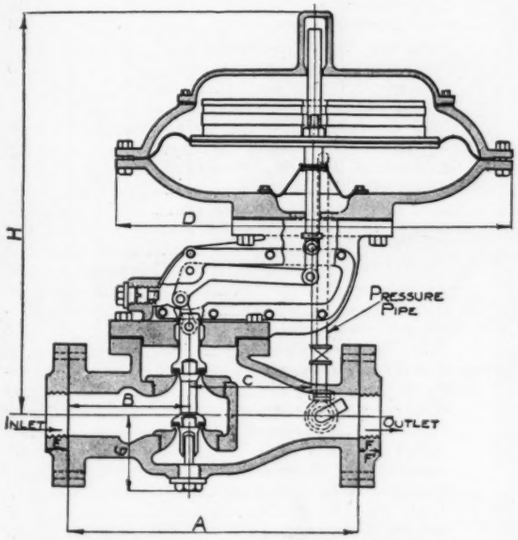
L. A. G. AND E. CORP. REPORTS GAIN IN EARNINGS

Net earnings of the Los Angeles Gas and Electric Corporation for the 12 months ended June 30, totaled $5,995,443.31, as against $4,291,457.33 for the preceding 12 months, an increase of $1,703,985.98 or nearly 40 per cent, according to a statement issued late in July.

PITTSBURGH EQUITABLE METER CO. ENLARGES PLANT

Announcement of an expansion program has been made by the Pittsburgh Equitable Meter Company, manufacturer of gas, water, oil and gasoline meters and gas pressure regulators The first step in the plans of the company will be the erection of a new building to adjoin the present plant.

Reliance Balanced Valve Regulator



Low Pressure Sizes Up to Six Inches

This Regulator embodies many new and novel features which have enabled us to produce a regulator with larger capacity, greater accessibility and more sensitive and accurate regulation. We offer it in full confidence that it will further enhance the reputation of the Reliance Line.

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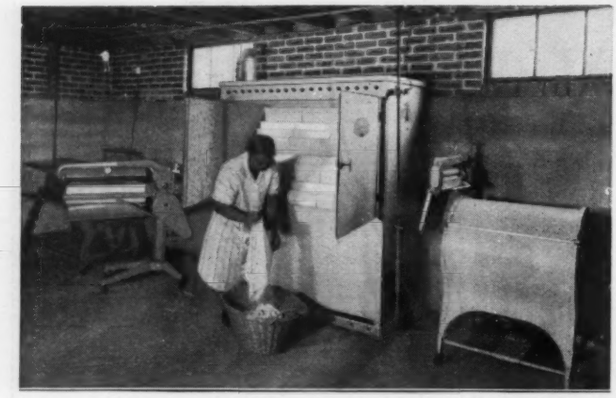
Established 1910
Analyses and tests. Represent Pittsburgh Testing Laboratory for inspection at Eastern foundries, mills and shops.
Offices & Laboratories
920 Santee St., Los Angeles
651 Howard St., San Francisco

WESTERN GAS from time to time receives requests from manufacturers asking to be put in touch with capable men or organizations in the Southwest or on the Pacific Coast who are able to effectively market their products in the western gas industry.

We also receive requests for suggestions from men or selling organizations covering the Pacific Coast as well as the Mid-Continent section, who desire to extend their activities in this industry by taking on new products or additional lines.

If we can be of service to you in this way, get in touch with any one of our three offices—Los Angeles, 124 West Fourth Street; Dallas, 307 Thomas Bldg.; San Francisco, 447 Sutter Street.



Keep the Washing *at* HOME!

EVERY washing done away from home is a **definite, calculable** loss to the gas company. It means, absolutely, decreased gas consumption from that particular home. It represents a loss from water heater, dryer, ironer and other appliances. And this loss over a period of weeks, or months, is surprisingly large.

You can stop this loss **for all time and increase your domestic load at off-peak periods** by merchandising

The LAMNECK LAUNDRY DRYER

It is the connecting link in the labor-saving chain of domestic laundry equipment—washer, dryer, ironer. It dries the clothes **perfectly** on every washday and protects them from dust, soot and sudden showers. It affords drying space equal to 60 ft. of clothes line. It sterilizes every garment. It has an indirect heating unit thermostatically controlled.

Plan **now** for a sustained, merchandising drive on this key appliance which controls all washday operations. When a housewife has the efficient, convenient, thoroughly dependable Lamneck Laundry Dryer the **washing stays home!**

THE W. E. LAMNECK COMPANY
443 Dublin Ave.
Columbus, Ohio

The W. E. Lamneck Company,
443 Dublin Ave., Columbus, Ohio.
Send complete dryer information and details of your attractive dealer proposition.

Name .....

Company .....

City .....State.....

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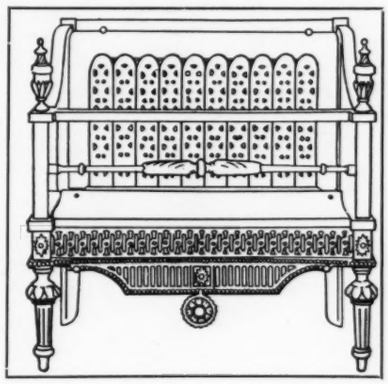

The illustration is the new Humphrey Radiantfire No. 55. A period model of surpassing beauty in silver gray and brass.

Life and Health and Radiant Heat

All the world is in quest of health. Ungents, nostrums, specifics and remedies; fads, faiths and fancies all have their followings.

Yet the greatest giver of life, the greatest restorer of health still remains the same—the Infinite's finest gift to man—Sunshine.

Now, as never before, is manifested a growing appreciation of the health-giving values of the radiant heat and light rays of real and artificial sunlight.

The radiant rays from the Humphrey Radiantfire are as similar to the magic, invisible, health-giving rays of the sun as science can achieve in the gas-burning field.

This simple, yet scientific truth is the most important modern development in the gas heating world. For it means that the Industry can truthfully say, "When we sell you a Radiantfire, we sell you Health."

Ask for the folder "Radiant Heat for Health"

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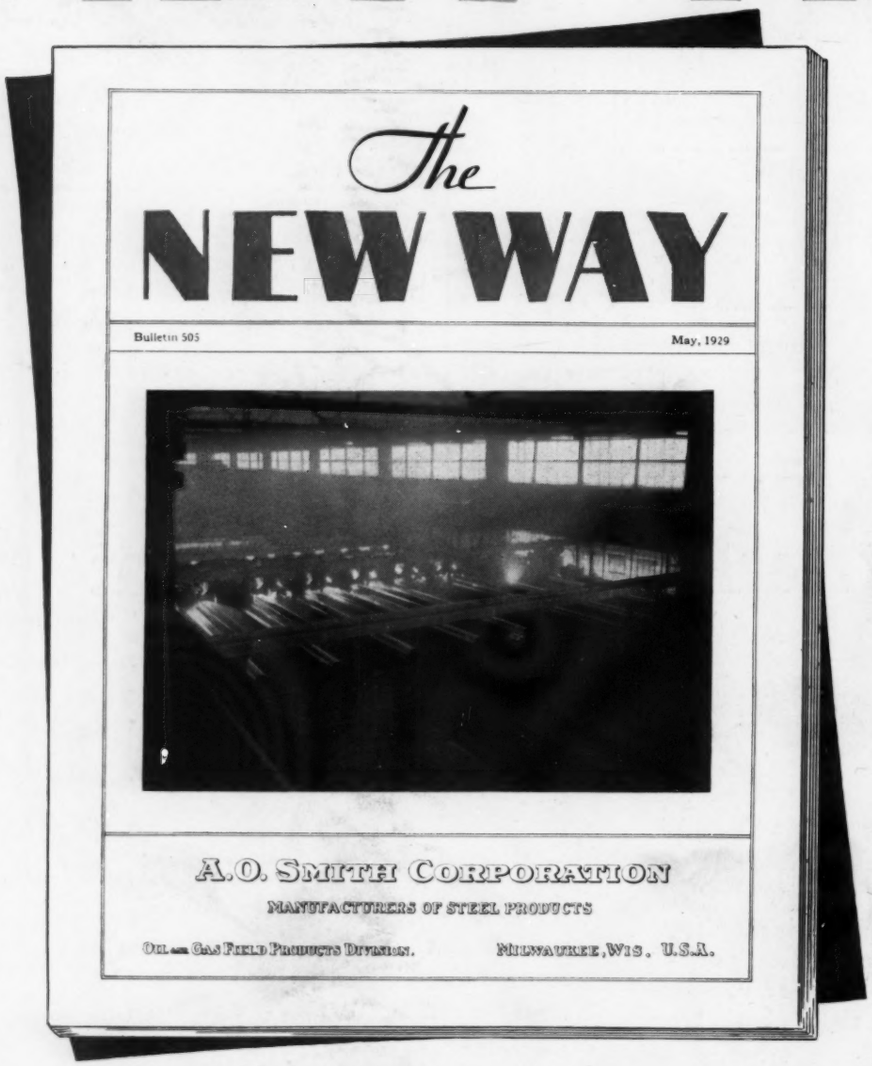
The NEW WAY



—is the title of a new book.

In it are stated the facts of a manufacturing organization entering an established field with a product made in a new way—and in two years becoming the leading figure in that field.

This is the story of superior line pipe at the rate of 25 miles per day.

A copy of this book should be in the hands of everyone interested in Oil and Gas Underground Transportation.

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